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EDITORIALS

THE FIRST MILESTONE . . . With this issue AMERICAN ANTIQUITY completes its first volume and its first actual year as your journal. This means that our basic financial worries are practically over, providing all present members of the Society re-subscribe to membership with reasonable promptitude. It has been an up-hill fight all the way, but with a worthy object in view, and with the fine support of fellow officers and affiliates in the Society, for which I in particular am deeply grateful, it has seemed a worth-while battle. If the journal reflects some measure of success, your Secretary-Treasurer and the assistant editors are responsible to no slight extent.

We confidently expect that Volume II will show a marked improvement over Volume I. The first issues of a new, unknown journal are very apt to show imperfections which experience and the development of a spontaneous support will tend largely to eradicate in later issues. All indications point to a larger and better journal. If this anticipated improvement does not materialize, I should advise you by all means to acquire the services of a new editor.

OUR NEW OFFICERS . . . The new fiscal year brings us the regular change in officers, and we welcome with all good wishes and a pledge of support our new executives, President Diamond Jenness and Vice-President Harold S. Gladwin. It is with shameless alacrity that I relinquish to their use the major portion of this editorial division.

THE CANADIAN FIELD . . . The heavy hand of precedent demands that, like the last president of our Society, Dr. Parker, I should pen a few lines for the journal. For me it is not an easy task, because my duties at the National Museum of Canada have forced me to direct most of my energies to ethnological problems rather than to archaeolog-

ical ones. The number of trained archaeologists in Canada may be counted on the fingers of one hand. If then I venture to outline a few of our problems as they present themselves to me today, it is with the hope that some of my readers will forget all international boundary lines and will turn their feet northward to help us solve them. I can assure them that Canada is a very pleasant country in which to spend a summer, provided they avoid a few forested or tundrous localities whose primeval inhabitants, the mosquitoes, naturally resent any human intrusion.

In eastern Canada Mr. W. J. Wintemberg, of our National Museum staff, is gradually unravelling the development of the intrusive Iroquoian cultures and separating them out from the contemporary Algonkian. Neither he nor anyone else, however, has yet discovered a pre-pottery site in the St. Lawrence basin rich enough to disclose the outlines of the culture phase that preceded all recognizable influences filtering in from the Ohio basin. Somewhere or other, underlying, we hope, an Iroquoian site which will certify to the time sequence, there must be remains of inhabitants earlier than those of whom we as yet have records. We presume that they spoke the Algonkian language. Can it be that the present-day Micmac Indians of the maritime provinces are their descendants, as R. B. Dixon thought? What, again, are we to think of the now extinct Beothuk Indians of Newfoundland? It is generally believed that they did not occupy that island for any long period, but migrated thither from Nova Scotia. Yet in that province we have found no remains that we can ascribe to them, no remains at all, indeed, that with certainty precede its habitation by the Micmac.

On the plains we have accomplished still less. We have found numberless celts, arrowheads, hammer-stones, fragments of pottery and other objects, but nothing that seems older than 300 to 400 years, or that indicates any earlier phase of culture than that which reigned at the first impact of European civilization. In British Columbia, again, the scratchings of the last forty years have added little or nothing to what we already knew from the researches of Harlan I. Smith in the Nineties of the last century, published in the Jesup Expedition reports. Yet there is no dearth of archaeological sites; several are known in the interior of the province, and along the coastline there are literally hundreds of shell-heaps varying in depth from a few inches to nine or ten feet, and in length from a few yards to nearly a mile. Many are buried beneath a heavy growth of forest; others are being rapidly destroyed by winter storms. The worker in this field will require considerable funds

and a combination of patience with good luck to make any effective contribution to our knowledge; but no one can doubt the wealth of material that lies buried along this coast, or the likelihood of important differences between the north and south that will illuminate its past history.

The archaeological specimens recovered from the Mackenzie River basin scarcely exceed a score in number, and tell us no more than we can gather from the accounts of the earliest explorers. Here is indeed a most difficult country to work in, though the future may see discoveries around the shores of Lakes Athabasca and Great Slave, possibly along the old beach lines that mark their earlier levels. During the last twenty years, however, we have gained a new vista into Eskimo prehistory, mainly through the splendid researches of Therkel Mathiassen in Canada and Greenland, and of H. B. Collins in Alaska. Canada undoubtedly holds the secret of the mysterious Dorset culture, perhaps, too, of the Thule that swept across the Arctic from Alaska to Greenland many hundreds of years ago. In this region, too, there is no lack of splendid sites awaiting investigation; for though unscientific traders, and Eskimo inspired by them, have ransacked a certain number of sites, the Canadian government has strictly forbidden any further excavations without a special permit, and it restricts the issuance of such permits to competent archaeologists accredited by some recognized institution.

Eskimo ruins, and the shell-heaps on the British Columbia coast, may possibly carry us back into the second half of the first millenium A.D.; but nowhere else have we discovered as yet any remains that seem older than a very few hundred years. If we believe, with nearly all anthropologists, that the New World was peopled from the Old by way of Alaska and Canada, then somewhere or other there must surely be traces of far earlier remains. No one has searched the old shore lines of the postglacial Lake Agassiz, or the raised beaches around the great lakes in the Mackenzie River region; and of the low basin at the heads of the upper Yukon and Liard rivers, where the Rocky Mountains die away and migrant bands could pass without difficulty from one watershed to the other, we were ignorant until a few months ago. Canada, unlike the United States, is sparsely settled, and large areas remain seldom trodden by the foot of man. Yet the archaeology of the one country is inseparably linked with that of the other. May we not then advise some of our younger and more adventurous field workers to follow the old and time-worn adage, "Go north, young man, go north"?

DIAMOND JENNESS, *President*

METHODOLOGY IN THE SOUTHWEST . . . It has been said that a new physical type, *Homo americanus*, is evolving out of the various peoples who have made their home in the New World. This is, of course, a matter for the physical anthropologists to decide, but, as archaeologists, it is fitting for us to try to find the cultural characteristics which distinguish such a type. It seems to me that one of the outstanding traits of the species *americanus* is his addiction to filing systems, card catalogues, coloured labels and pins, and the great range of devices which help us to put everything in its place, and have a place for everything. There are probably no other people in the world today who have developed methods of classification to the same degree as have modern Americans, and it is perfectly natural that some of these methods should have crept from business into the sciences.

As a consequence, our fauna and flora, our libraries, and our golf clubs are all neatly tagged with a number, a name, or a label, and the innate yearning of the stamp collector, which is in all of us, can be assuaged by placing the 2 between the 1 and the 3, and our sense of the fitness of things is satisfied.

In recent years, this obsession for method has entered into archaeology, particularly into that of the Southwest, and, in some respects, I have been partly responsible. In about 1928 and 1929, three institutions were founded in the Southwest: the Laboratory of Anthropology, the Museum of Northern Arizona, and Gila Pueblo. Each one of these institutions began a type of investigation which had not theretofore been emphasized, archaeological surveys in which as many sites as possible were visited, surface indications were described, and collections made of sherds and flints, without excavation.

It became immediately apparent that it would be essential to agree on a method of naming and describing what was being found during the course of these surveys, so, at Pecos in 1929, and again at Gila Pueblo in 1930, conversations were held with various interested persons and methods were discussed. As a result, in the summer of 1930, we published *A Method for the Designation of Southwestern Pottery Types* (Medallion Papers VII; W. & H. S. Gladwin, Globe, 1930), in which we proposed a binominal system of naming various pottery types, the main idea being a generic name based on colour, such as black-on-white, and a specific name based on some geographical feature, such as Tularosa. By this means we would avoid any chronological or cultural connotation such as is implied in such terms as pre-Pueblo Black-on-white, or Caddoan Redware.

For several years this method has worked fairly well; most men in the Southwest knew what we were talking about when we mentioned a ruin containing St. Johns Polychrome or Tularosa Black-on-white. Sometimes we found that a large series of ruins, as in the Upper San Francisco Valley, contained Tularosa Black-on-white to the exclusion of St. Johns Polychrome, whereas larger ruins, farther north around the town of St. Johns, contained a smaller amount of Tularosa wares and a great deal of St. Johns Polychrome. It was a logical step for us to begin speaking of a Tularosa *Phase* and a St. Johns *Phase*.

As time went on, a number of such Phases began to form. Then dates were established from tree-rings; a chronological perspective began to form, and, as our surveys covered more and more ground, certain Phases disclosed relationships through common features of pottery designs, architecture, and so on, and the Phases grouped themselves into *Branches*. These Branches, in turn, resolved themselves into *Stems*, so that we had a fairly comprehensive archaeological tree which covered a good deal of territory, and covered the evolution of the Southwest from Basketmaker times up to the present day. Recognizing that our modern tribes are made up of several linguistic stocks, Keresan, Tanoan, and others, it was again rather a logical step for us to employ a little speculation and try to fit these modern features into our picture and see how well such things as physical types, linguistic stocks, material culture, and chronology could be combined to make an intelligible theory.

The result was the publication, in 1934, of *A Method for the Designation of Cultures and their Variations* (Medallion Papers XV; W. & H. S. Gladwin, Globe, 1934). This paper came out at about the same time as the McKern classification, and it is a very remarkable fact that the two methods are almost identical except for the terms employed. There is probably a little more emphasis on chronology in our Phase system than in the McKern method, but this is only because we have had the advantage of tree-ring dating in the Southwest. We have also indulged in a little more speculation in our Roots, possibly more than is justified, but this may be attributed to an over-developed desire on our part to have everything accounted for. Other than this, the methods agree:

McKern		*Gladwin*
Basic Culture (Fundamental determinants)	=	Root (Physical Type; Language Stock)
Phase (Important cultural limitations)	=	Stem (Major cultural and geographical divisions)

Aspect (Characterized by more specific traits)	= Branch (Corresponding in importance to Kidder's culture areas)
Focus (Exhibiting peculiarities in cultural detail)	= Phase (covering consistent variations in culture)
Component (A specified manifestation)	= Components have been listed in our Phases, but not named as such. This designation will be added in our next revised edition.

Up to this point there is not much to quarrel about; the method has been put to a severe test in our excavations at Snaketown and came through with flying colours. Every feature at the site has been fitted into its Phase, and our analysis of early Hohokam culture has been made infinitely easier because of the system.

But now men are beginning to ask: "How much further are you going in this business of naming things"? Speaking only for ourselves, I think we have gone almost far enough in those cultures of the Southwest which are more or less familiar to most field workers. There will undoubtedly be a few more Phases needed to fill existing gaps, and possibly one or two more Branches, but the end is now more important than the means. If the classification were carried much beyond this point, I should expect to run into a confusion of tongues.

My original suggestion in Medallion VII of using a generic and a specific name for pottery types implied a biological analogy which I now think was a mistake. The idea is being carried too far along biological or zoological lines, and men do not realize the profound differences which exist between zoological species and the things which have been made by men and women.

Zoological species do not cross and intergrade; evolution is so slow as to be hardly distinguishable. The evolution of culture, particularly in the Southwest, was stepped up to almost incredible speed, and on every side we find evidence of merging and cross-influences. The analogy is closer to the barnyard than to zoological species, and the danger is just as great in archaeology of defining new types which some individual may believe to be distinct as it would be to expect that some types of domesticated animals will breed true. We are really dealing with varieties rather than species, and, in consequence, there are bound to be a great many intermediate and transitional types.

If new types shall be created on insufficient evidence, particularly on sherds only, it will be just as if one should find the green tail-feathers of a Brown Leghorn rooster and announce "Ah! a Green Orpington!",

give it an A.O.U. number, and add one's name in brackets as the discoverer of a new species.

Besides the confusion which must inevitably result from an overindulgence in classification ("Taxonomic Measles", according to Dr. Kidder), there is the difficulty of adequately describing types so that other persons will know what is meant. In the five series of Southwestern pottery types which we have published up to date we have confined ourselves to naming various pottery types which we have believed were distinguishable from one another. To the best of my knowledge there has been no confusion between any two of these types, but recently others have defined and described variations of these types, and actual experience has demonstrated that it is practically impossible to describe such variations in words which avoid confusion.

Several suggestions have been made which have been designed to solve this problem; presence or kind of slip, of tempering material, or of characteristic cross sections. It is probable that such criteria could be determined by petrographic analysis, and used to good advantage, but this requires a thoroughly trained technician and, as the application of petrographic methods to the analysis of pottery is a new technique, it is very difficult to obtain such training in most universities. In addition, this kind of analysis involves considerable expense in the grinding and preparation of thin cross-sections (3/100 mm.). For the average field man such analysis is out of the question, and yet Miss Anna Shepard has shown that these criteria are of little value unless they have been determined by petrographic analysis.

I do not wish to give the impression that I am trying to tell anyone else how his work should be done. At Gila Pueblo we have inaugurated certain methods; some of these have proved to be successful; after giving them a thorough trial, we have published them so that others could take advantage of them if they wished to do so. As far as we are concerned, we have reached the point where we think it is better to strengthen what has been done by more intensive study than to name new variations of pottery or phases which may tend to confuse rather than clarify our minds. This does not mean that finer distinctions will not be made as knowledge increases, nor that such distinctions would not warrant publication when they could be shown to indicate cultural or chronological relationship. It does mean that no method is as important as the result which it is designed to achieve, and that it is possible to defeat both the purpose and the method by too great elaboration of non-essential details.

HAROLD S. GLADWIN, *Vice-President*

A NEW VOICE . . . *The Kiva*, a new archaeological publication for the Southwestern area, made its bow to the students of that field with five numbers of Volume I, issued in May, October, November and December, 1935, and January, 1936. It is published by the Arizona Archaeological and Historical Society with headquarters at the Arizona State Museum, Tucson, and is edited by the Rev. Victor R. Stoner. AMERICAN ANTIQUITY welcomes this new voice in the Southwest to the ranks of American archaeological publications.

THE "SIMPLE BONE POINT" OF THE SHELL-HEAPS OF THE NORTHEASTERN ALGONKIAN AREA AND ITS PROBABLE SIGNIFICANCE

E. E. Tyzzer[95]

IN THE STUDY of a material culture, it appears that the rarer, more striking or more elaborate objects are often given undue weight while the more common and hence more widely used articles are too frequently neglected. Although the bone point of the type to be considered is by far the most common artifact found in the shell-heaps of Maine and Nova Scotia, only casual and incomplete descriptions are available. There is no general recognition of it as a distinct type, and the interpretations of its usage which are offered are made without serious consideration of available evidence.

The material on which the present study is based consists primarily of objects found by the author in digging over a portion of a shell-heap on Harbor Island[96] off Naskeag Point, Brooklin, Maine, and also of collections in the Peabody Museum at Harvard from numerous sites along the New England coast. From a casual sampling of other shell-heaps on both mainland and islands in the neighborhood of Naskeag Point, and from inspections of the great quantity of shell-heap material on exhibition at the Lafayette National Park Museum at Bar Harbor, it seems clear that the Harbor Island material may be regarded as representative of the Penobscot Bay and Frenchman Bay region. Smith and Wintemberg[97] report a very similar content in Nova Scotia shell-heaps where the bone points in general appear to correspond very closely to those of the Maine coast. Smith in his section of the report employs the term "simple bone point" which appears to be especially appropriate, at least until the chief purpose for which such objects were intended is made reasonably clear. From the examination of collections made at various additional sites along the Maine coast, it is found that such bone points are widely distributed and abundant. Those from some localities appear rather crude and clumsily made, but have the same

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[96] Not only was permission kindly granted for the excavation of this site by Mr. Herbert F. Carter, but arrangements were afforded to facilitate the work in every possible way.

[97] Smith, H. I. and Wintemberg, W. J., Some Shell-heaps in Nova Scotia, Nat. Mus. of Canada, Anthrop. Series No. 9, Bul. 47, 1929.

general characteristics. The exact extent of their regional distribution must be left undetermined, but that information which is at present available will be discussed later on.

In describing the simple bone point as a distinct type, it should not be understood that there is no variation in pattern, for there is great latitude in regard not only to size but also to form, especially as affected by proportionate dimensional variation. Notwithstanding such variation, there are certain characters that occur with great regularity, and departures from type are to a large extent due to peculiarities of the piece of bone employed or to differences in the quality of workmanship.

The simple bone point is characteristically somewhat spindle-shaped with one end thicker and heavier than the other which is thin and tapering. Hence one of its most notable features is asymmetry with respect to its extremities. We may consider the heavier end as the anterior and the lighter end as the posterior one. In case the piece of bone utilized varies in texture in the course of its length, the denser, stronger portion was almost invariably chosen for the anterior end or point. Another character, the surface polish which usually extends over all except the tapering posterior portion, this being in contrast typically fluted, also serves as a reliable basis for orientation. Shorter and medium-sized points usually taper from their middle portion toward both ends, although some examples made from pieces of thin-walled bone may be relatively broad posteriorly, tapering only towards the anterior extremity. Even in the latter case, the posterior portion is usually thinner and hence lighter. Longer specimens show a central portion, or body, of a nearly uniform width and thickness. The heavier or anterior portion is sharpened to a conoidal point while the lighter, posterior portion is usually tapered gradually to a thin end that may be either pointed or left blunt and unfinished. Dependent either on the character of the piece of bone from which the piece is made or on the quality of workmanship, the cross section of its middle portion may be ellipsoidal, oval, oblong, circular, quadrangular, plano-convex or crescentic. Thus apart from the general features of having one end thick, heavy and polished, and the opposite end thin, light and unpolished, we encounter a wide range of variation in contour. Further subdivision of bone points having the above general characters into special types might perhaps be considered, but since all forms here included constitute an unbroken series and since variation is so general that it is rather difficult to find any high degree of duplication even in a series of several hundred, it seems preferable to deal with these objects collectively as constituting a single

category. Except in the obviously newly made points which are of rare occurrence, and in those that have been resharpened, the anterior extremity almost invariably shows evidence of fracture of the shattering type or is otherwise blunted, chipped, or split in a manner indicating terminal impact. One may reasonably expect that a study of the peculiarities of breakage and the evidence of wear through usage may throw some light on the purpose for which these points were designed.

While a more intensive study has been made of the bone points found in the first season's work, the information gained applies, as far as may be judged, to specimens found in subsequent seasons as well as to those in other collections from Maine shell-heaps, except, as might be expected, a greater amount of material has furnished some extension in the range of variation. Doubtless a similar sampling of certain other sites might, on account of local peculiarities, fail to furnish representative material, but the Harbor Island material appears to be characteristic of a wide surrounding region. The first season yielded thirty-five complete or approximately complete specimens of the simple bone point, one hundred and seventy-one less complete as the result of terminal fracture, and one hundred and thirty-three fragments, or a total of three hundred and thirty-nine pieces. On the basis of the characters already described, three hundred and thirty-six are readily oriented as to anterior and posterior; the three exceptions are fragments from middle portions, polished throughout their entire length. The measurement in three dimensions of one hundred and thirty-two specimens, selected as the more nearly complete, furnishes the following data.

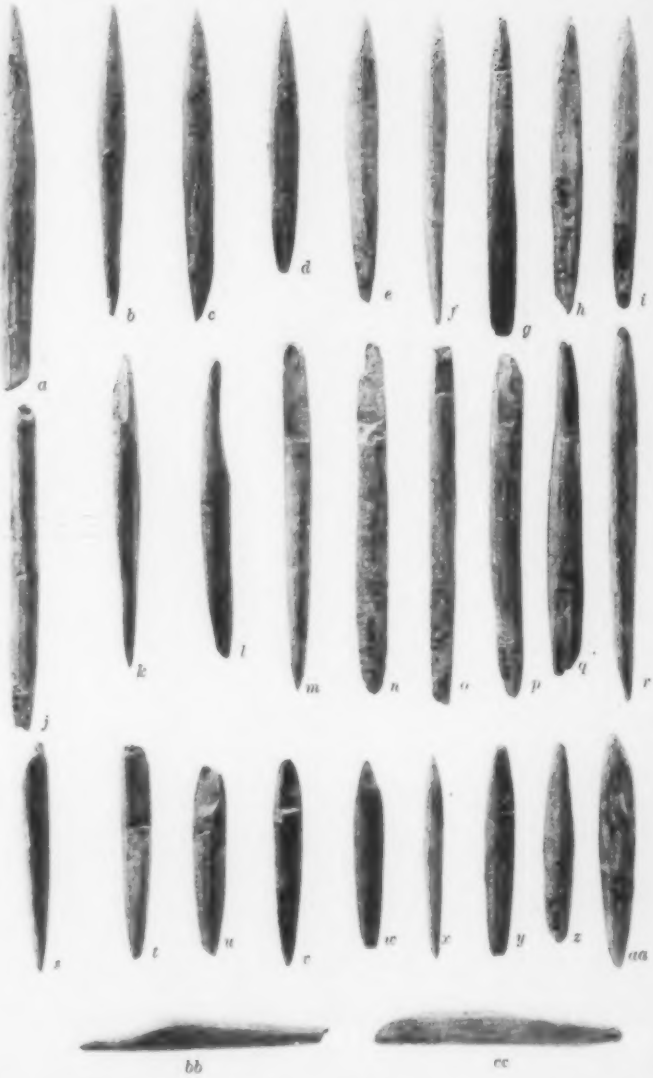
Length in mm.			Width in mm.			Thickness in mm.		
Average	Maximum	Minimum	Average	Maximum	Minimum	Average	Maximum	Minimum
53.2	120	35	7.33	12	6	5.33	7.5	3

Several unusually long points may have been designed for a special purpose, but as these show all the essential features of the simple bone point, they have been included. The center of gravity as determined approximately by balancing, was anterior to the middle in one hundred and thirteen, or 85 per cent, approximately in the middle in twelve, or 9 per cent, and posterior in seven, or 5 per cent.

The general occurrence of a pronounced anteroposterior asymmetry should be clear from the characteristics already described. In the study

of the above group of specimens together with those found in subsequent seasons, it is unusual to find points which are not flattened to some degree. This is true of points showing the highest degree of workmanship as well as the more rudely made ones. With a variable degree of flattening, we may now consider the bone point with respect to bilateral and bifacial symmetry. This may be based on the peculiar character of the piece of bone utilized, "inherent" asymmetry, or may result from the process of manufacture, "technical" asymmetry. Bilateral asymmetry is comparatively infrequent, as it occurs in less than 10 per cent of the specimens studied, and in at least one-half of these is based on the nature of the bone employed. In contrast, nearly 97 per cent show bifacial asymmetry which is inherent in character in about 19 per cent and clearly due to manufacture in 78 per cent. While the first type of bifacial asymmetry is frequently due to the troughlike form of strips cut from small, thin-walled bones, the second is quite generally due to the tapering of the posterior portion obliquely, so that the posterior extremity is off center. Thus the better made specimens are cut away posteriorly in such a manner as to furnish an oblique, usually quite flat surface, such as would be suitable for a long simple splice (Plate 17-b; Plate 18-h). In about one-fifth of the bevelled specimens, however, this surface is convex, in some even more convex that the opposite surface. More rarely, the oblique surface instead of being flattened is slightly scooped out anteroposteriorly, so that its starting point is marked by a shoulder. Also quite a proportion of the bone points, instead of having the posterior portion tapered obliquely, have a straight, flat face extending for the greater part of their length. In these specimens, the anterior extremity is sharpened off center. However, many of the shorter specimens of this type doubtless represent points that have been shortened by repeated resharpening. The evidence appears conclusive that the bone points were continued in use after being broken, some being resharpened, others merely having the rough edges smoothed off, many being reduced by successive fractures to mere stubs consisting of little more than the unpolished tapering posterior portion.

In Figure 8-A is represented diagrammatically a bone point modified by successive resharpenings at A^1, A^2, A^3, and having as its longitudinal axis AB. If the dotted line XY is regarded as the axis of the shortened point resulting from the final resharpening, the latter will appear to be sharpened off center, but if its origin is taken into account, it will then be seen that it is sharpened on the longitudinal axis of the longer bone point from which it has been derived. Also in case those bone



Characteristic simple bone points: complete (a–i); with terminal fracture (j–r); reduced to stubs (s–aa); with single barb (bb); with incised figure (cc).

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points with a relatively long flat face were spliced by this surface to shafts, the apparent sharpening off center would tend to align the tip with the long axis of the shaft.

The types of breakage encountered in the simple bone point are, however, far more important as evidence of the nature of the usage to which it was put, than suitability of shape as regards fastening to a

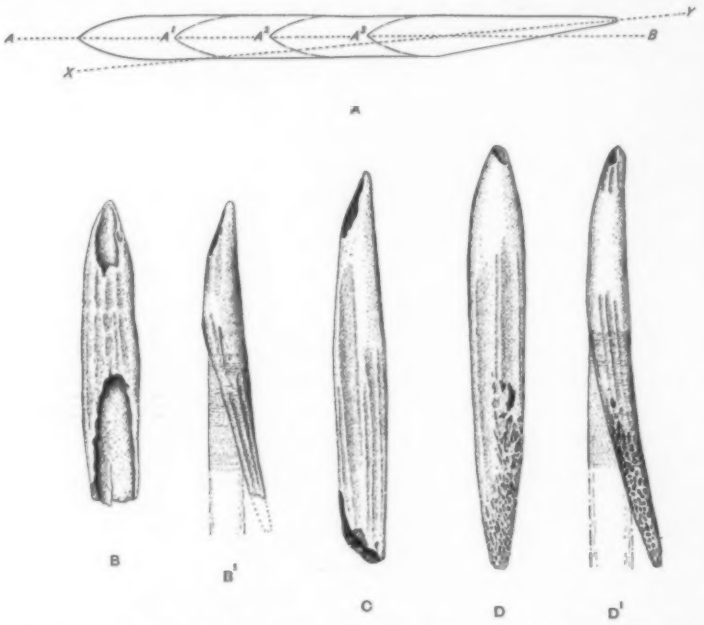

FIG. 8.—A—The effect of successive resharpenings of the simple bone point; B—hollow bone point bevelled from one surface posteriorly as well as in sharpening the tip; B¹—probable method of fastening point shown in "B" to shaft; C—hollow bone point of flattened form, with cavity too small to admit a shaft; D—convex face of a "bent" form of bone point; D¹—lateral aspect of point shown in "D."

shaft. The great majority of these points either show at their anterior extremity evidence of a shattering type of fracture or are chipped, dulled, or split, in each case in a manner clearly indicating terminal impact. No complete points have been found which are both perfectly sharp and polished to the anterior tip. In fact in the series of more than

eight hundred specimens thus far collected, only one, the tip of a broken point, shows the polish extending to a sharp, undamaged anterior extremity. In all other specimens in which the polish extends to the tip, the latter has been dulled through usage (Plate 18-h, i). A considerable number of specimens are found that show a well polished surface except that the anterior extremity is cut to a sharp point. Since in each instance the polished surface is cut into, it is clear that such points have been resharpened (Plate 17-c, d). Rarely a well made point is found with a sharp anterior tip but showing no polish whatever. These are considered to be newly made points (Plates 17-b, f; 18-f). The question may be raised whether the polish which generally covers all except the posterior, tapering portion of the bone point is derived from usage or has been purposely bestowed. While the rarity of sharp tips showing polish fails to support the latter alternative, this possibility cannot be eliminated on negative evidence. Although there is ample evidence of sharpening with a cutting implement, there is no indication of sharpening by grinding. With the notable polish frequently encountered on the fracture-surfaces of broken points, and with the lack of polish on sharp tips, the conclusion might be reached that the polish represents the effects of usage rather than the finishing process. In support of this view, rude points are encountered consisting of rough strips of bone upon which little or no effort has been made to work them into shape, but which show nevertheless a notable polish of the anterior portion. A few simple experiments have sufficed, however, to throw light on this question.

ARCHERY EXPERIMENTS TO DETERMINE THE NATURE OF FRACTURE OF BONE POINTS WHEN EMPLOYED AS ARROW-POINTS AND THE EXTENT TO WHICH THEY BECOME POLISHED THROUGH SUCH USAGE.

In the first experiment, five points of various lengths and thicknesses were shaped from beef bone, being patterned after representative shell-heap specimens. These were first roughed out with saw and file and then scraped into shape, the surface being left fluted and unpolished. It was found that the bone could be scraped advantageously with an implement having a wide angled or square edge, the shank of a large file being employed for the most part. A sixth point was prepared leaving the anterior portion unshaped and unsharpened. The six points were spliced to reject, twenty-seven and one-half inch arrows of light wood (Port Orford cedar), which were subsequently shot without being feathered. In splicing the tip, the arrow was bevelled to fit the bone point and the two glued together. On the following day, the splicing was wrapped with

Specimens of worked bone: worked material (a–e); new unpolished point (f); unpolished point dulled through usage (g); long point with fractured tip (h); point showing longitudinal fluting (i).

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moistened caribou sinew, and later on the shaft including the spliced portion was varnished.

This set of arrows was then shot repeatedly into the gravelly and somewhat rocky loam of a slope at a distance of forty yards, using a forty-five pound ironwood bow. It was soon found that the bone points were not notably affected by shooting into loam unless pebbles were struck, when terminal fracture occurred, the extent of the latter depending to some degree on the size of the stone. As the arrows were shot in rotation without resharpening the points after they became damaged, it was soon seen that even minor imperfections, such as a slight chipping at the tip, greatly increased the incidence of fracture. Thus for example, a point which had withstood ten shots before becoming slightly chipped, would thereafter show a rapid succession of fractures in subsequent shots. Moreover the unsharpened point was from the first fractured at almost every shot. That points with perfect tips should withstand impacts that cause fracture in those with chipped or previously fractured ones showed at once the advantage of keeping the tips sharp and smooth. One of these six points withstood twenty-five shots into loam without being seriously damaged and was later shot fourteen times into a gravel bank at a distance of eight paces before showing serious fracture. Two others withstood fifteen shots into loam and another showed no fracture until the fourteenth shot. One of the bone tips was undamaged on being shot to a depth of more than an inch into soft wood (white cedar).

Since shooting into loam produced only a slight polish on the exposed portion of the bone point, and this confined chiefly to the tip, three other arrows were similarly prepared for shooting into gravel. These were of heavier wood (southern pine), twenty-eight inches in length, and fletched as standard archery arrows. They were driven into a bank of coarse, sharp gravel fifteen times from the same forty-five pound bow at a distance of eight paces, so that they would strike at almost maximum velocity. Here again it was observed that once the tip was chipped, almost every succeeding shot produced further damage. Under this treatment, splitting from the tip started in two of the three points. It was also found that being driven into sharp gravel only produced a superficial smoothing of the bone point and did not serve to eliminate the fluting or other unevenness of the surface, at least in the number of shots that a point may be expected to withstand (Plate 19).

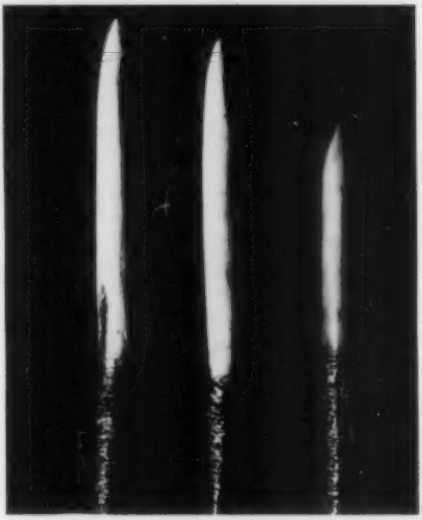
The question may be raised whether in fastening the bone points in a simple splice the arrow would be rendered imperfect in that it would be weighted off center. Accordingly, an experiment was carried out with a target arrow which was shot before and after having its tip weighted off center. The iron point was first removed, this end of the shaft was drilled longitudinally as near the surface as possible, a steel nail then inserted, and the iron point replaced. The arrow shaft with feathering weighed 22 grams, the steel point 3.7 grams, and the nail inserted for off center weighting 2.2 grams. In twenty shots before and in twenty shots after weighting off center, all at a distance of forty yards, a slightly

better score was made with this arrow after weighting, although it was necessary to elevate the point of aim slightly. Hence the simple splice as a method of fastening a bone point could hardly introduce any appreciable fault in the flight of such arrows as were probably employed in this region.

Test of suitability of bone points for multipointed projectiles. Since the posterior bevel of the simple bone point would fit in quite as well for lashing to a multipointed projectile or implement, two points were set at an angle of about 17° to each other at the end of a light arrow, being first glued and then firmly lashed. This two-pronged arrow on being thrown repeatedly by hand into a rock pile, showed terminal chipping of the bone point identical in character with that shown by shell-heap specimens, but transverse fracture could not be produced. It was then shot repeatedly point blank at a soft wood board at a distance not over twenty feet. It rebounded about as often as it penetrated, but under this treatment the arrow was broken off behind the lashing at the sixth shot. The ability of bone points to withstand violent impact, even though set at an angle to the direction of the impelling force, indicates the great strength of bone and its suitability for projectile points.

The results obtained in these experiments clearly show that bone points made to reduplicate as closely as possible shell-heap specimens of simple bone points, except that they were left unpolished, when actually used as projectile points, acquire only a very slight polish, chiefly at the tip. Neither the inequalities of the newly shaped point nor the rough edges resulting from fracture are eliminated. Hence it is quite evident that the polish was intentionally bestowed, primarily as a finishing process but also in the rounding off of fractured tips. The various types of breakage and blunting seen in the bone points from the shell-heaps are closely reduplicated in the chipping and fracture of experimental bone points shot into loam and gravel; except that in the former the edges of fractured surfaces are frequently rounded off and polished.

Whether the exposed portion of the bone point was customarily polished before or after being lashed to a shaft is not clear, although it seems most probable that the smoothing off of rough edges resulting from fracture was done while the bone point remained attached. Occasional points show a certain degree of polish extending over the posterior portion, indicating that this was bestowed before lashing. On the other hand, some points (Plate 18-i) show a marked narrowing of the polished portion as compared with the fluted portion, but this could be brought about by holding the posterior end in the hand during the finishing process as well as by its being protected by lashing. There is no clue as to the technique employed in rounding and polishing. While the striae resulting from grinding are commonly quite obvious on beaver



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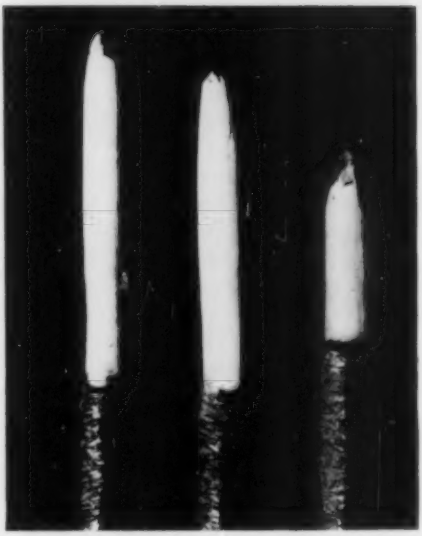

b

Three points shaped from beef bone and fastened to arrow shafts (a) before use and (b) after fifteen shots into coarse gravel at eight paces.

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tooth implements, such marks are lacking on the bone points. Only faint, straight, longitudinal striae are occasionally seen in the polished surface, and it seems more likely that these have resulted from usage rather than from the process of manufacture. The above experiments have served to demonstrate the suitability of bone for projectile points, since not only is this material durable and readily worked, but it also lends itself to reshaping after breakage.

A careful study of shell-heap material throws light on the methods employed in the manufacture of the simple bone point. Both Smith and Wintemberg[98] have called attention to the manner in which bone was grooved and then broken into narrow strips, and they illustrate pieces of bone in which long grooves have been sawed or plowed by some sort of cutting implement. In Maine shell-heaps there is also an abundance of similarly grooved bone, as well as the narrow strips into which it was cut. While this process doubtless furnished the material for the longer and better points, it is quite probable that favorably shaped fragments such as might be derived from the splintering of bone were frequently utilized, while smaller, thin-walled bones were in some instances scraped directly into shape without preliminary longitudinal sawing. We have one bone point which has been shaped from a fragment of a heavy needle, the notch at the base showing the position of the eye of the latter, while both faces are highly polished. Sawed strips were rounded off and worked down to the forms desired (Plate 18-a, b, c, d, e). In the final shaping of the points, the bone was cut by longitudinal planing strokes so that newly made, unpolished points are found fluted throughout their entire length (Plates 17-b; 18-f). The even sweeping strokes required to produce the fluting seen on long fine specimens would call for a high degree of skill. The presence of rather prominent striae in the longitudinal cuts is indicative of an implement with an imperfect edge such as a flint scraper. The only indication of grinding found on bone points has been noted on the bevelled surface where coarse scratches were in evidence in several instances, but these may have been accidental. Over the exposed portion of the newly made points of the better grades, the fluting is entirely ground away in the course of finishing, but in resharpening, the polished surface is cut into (Plate 17-c).

As to the purpose for which the simple bone point was designed, we have only indicatory evidence, although the latter is of such a nature as to carry considerable weight, and is also supported by the results of

[98] Smith, H. I. and Wintemberg, W. J., op. cit.

the experiments already outlined. The finding of entire implements of which these points formed a part might very well throw more light on the question than all our previous studies. While it appears that wooden artifacts have for the most part disappeared from Maine shell-heaps, it is to be hoped that eventually a find will be made that will serve to clear up this question. Casual reference to the employment of bone projectiles in other parts of the country is made in the accounts of early travelers among various Indian tribes, but the statements of such eye witnesses often fail to furnish much in the way of detailed information.[99] However, the oft-quoted statements in Rosier's narrative of Waymouth's voyage to the coast of Maine in 1605 have reference to the very region from which our points are derived, for he points out that the Indians near Monhegan had arrows "big and long with three feathers tied on, and nocked very artificially, headed with the long shank bone of a deer made sharp with two fangs in the manner of a harping iron. They have likewise darts headed with like bone, one of which I darted among the rocks and it brake not".[100] Champlain also states of the natives encountered at the Choüacoet (Saco) River, "Their weapons are pikes, clubs, bows and arrows, on the end of which some put the tail of a fish called *signoc* [horseshoe crab]; others use bone and still others have them all of wood".[101]

The opinions expressed by archaeologists as to the purpose of the simple bone point are generally noncommittal, usually ending with a begging of the question, in that they were probably used for various purposes. W. B. Smith[102] calls attention to the frequency of the simple forms of bone points, to the difference of the two ends, one being more acutely pointed and smoother than the other, to the shallow fluting of the surface and to the longitudinal striae. He also states that the "slightly shattered point is not an uncommon feature". He mentions the possibility of their being used as points for fishhooks, and quotes Rosier as above, suggesting that they may have been projectile points. H. I. Smith[103] states that the smaller of the simple bone points were

[99] Jones, C. C., Antiquities of the Southern Indians, particularly of Georgia Tribe, Appleton and Company, New York, 1873.

[100] Quotation from Willoughby, C. C., Prehistoric Burial Places in Maine, PM-P. 1., No. 6, 1898.

[101] The Voyages and Explorations of Samuel de Champlain, 1604–1616, Narrated by Himself, trans. by Annie Nettleton Bourne, 1922, New York.

[102] Smith, W. B., The Jones Cove Shell-heap at West Gouldsboro, Maine, Lafayette National Park Bul. No. 1, 1929.

[103] Smith, H. I., op. cit.

probably used for arrows and were inserted into a split shaft and held there by lashes; also that the small points may have been lashed to spears, arrows or fishhooks, or that they may have been used as fishhooks. Wintemberg[104] suggests that points of this nature may have been fastened to the arrow shaft with one edge inserted into a groove in the shaft and lashed in place so that the posterior end would project as a barb. Others have suggested that articles of this description may have been used as awls.

From the present study, the tentative conclusion is reached that the simple bone points are projectile points. The character of the fracture and dulling presented by the majority of specimens furnishes very convincing evidence of terminal impact. Furthermore, the fractures occurring in bone-pointed arrows shot experimentally into loam and gravel are in all respects similar to those occurring in shell-heap specimens. While the barb of a fishhook might show a transverse fracture as a result of being caught on a rocky bottom, it is inconceivable that it should regularly show unmistakable evidence of violent terminal impact, since there is no known way in which this could be accomplished under water. Simple bone points have little in common with objects recognized as awls or perforators. The former have thick heavy points, while the latter have slender attenuated ones, and it is difficult to understand why awls should consistently show evidence of terminal impact. The possibility has also been considered that the simple bone point may have had some connection with the gathering or preparation of clams, which evidently constituted a major activity in camps at shell-heap sites. It is readily conceivable that if utilized for the tips of digging implements they might acquire a polish and show evidence of terminal impact, but it would then be reasonable to expect a high incidence of transverse fracture. The latter, however, is not frequently seen, and it is also difficult to see how they could be securely fastened so as to withstand continued use in mud and water. Furthermore, the points appear rather too slender for digging and lack the toughness of various kinds of wood available in the region.

A feature that has generally escaped notice is the bifacial asymmetry of the bone point due to the posterior end of the point being tapered obliquely. This feature furnishes a means for simple, firm and effective splicing to a shaft, it being only necessary to bevel the shaft to fit the corresponding surface of the point and to lash the two se-

[104] Wintemberg, W. J., op. cit.

curely together. Except in cases of the more definitely bent points, this would fasten the point in the line of the shaft and thus provide a projectile that could be more readily withdrawn than one fitted with a point not conforming to the configuration of the shaft. The more uncommon, flattened, bent points could be similarly lashed, but by leaving the posterior end projecting, an effective barb would be afforded, while the penetrating point would at the same time be brought into alignment (Fig. 8-D, D[1]). Several well shaped curved points, tapering towards both extremities but with one slightly flatter than the other, and polished for their entire length, have not been included in the type under discussion, since none have been found showing evidence of terminal impact.

The simple bone points are not evenly distributed in the shell-heap, though they are found at all levels, even at the upper surface of the deposit. They often occur with other artifacts in the vicinity of fire areas where from several to a considerable number may be found within a small space. More occur in groups than singly, and in one instance several were found beside a large unbroken adze in a small elevation of loam not covered by shells where evidently these objects had been laid. In another instance a great number of artifacts of various sorts were found in a small space including a large amount of sawed and worked strips of bone (Plate 18-a, b, c, d, e), as well as a great number of bone points. Every specimen of the latter, however, was either broken or showed other evidence of usage.

For purposes of comparison, certain other distinct types of bone points, some of which are quite generally accepted as projectile points, may be discussed. First, those made from a hollow bone, such as the leg bone of a bird, with the tip sharpened to a bevelled point and with a flaring base, are well known and usually considered to be arrow points. Only one large point of this type was found at Harbor Island. There were several other hollow points, but in these the bone has been cut obliquely not only in shaping the tip but also the posterior extremity. Thus while the middle portion of the point is left tubular, posteriorly the bone is cut away from one side so as to leave this portion open and trough-like (Figure 8-B). Points of this type are obviously better suited for fastening on the end of a shaft than hollow points with either a flaring uncut, or a notched base, for a lashing applied over the posterior trough-like portion would bear directly on the shaft and thus bind it securely (Figure 8-B[1]). Their close relationship to the simple bone point is seen not only in the obliquely tapering posterior portion but also from

the fact that this is left rough as cut by the scraper while the remainder of the surface is polished. There are also hollow points in which the cavity is altogether too small for the insertion of the tip of a shaft (Figure 8-C). Since these are shaped and finished like simple bone points they may be classified as such.

Certain bilaterally asymmetrical points are generally recognized as projectile points and are believed to have been inserted on edge in a groove at the end of an arrow so as to furnish a head with a single barb. A single slender point of this type was found at Harbor Island (Plate 17-bb). Certain of the small number of bilaterally asymmetrical specimens included in the present series of simple points are also more or less suitable for being fitted on edge to a shaft. W. B. Smith[105] figures several somewhat thicker points, cut diagonally at the base, and H. I. Smith[106] pictures a similar one from Nova Scotia, all of which are quite distinct from the simple point in that they show bilateral asymmetry and have a heavy base. While, from the illustrations, these latter specimens would appear to be thick and clumsy for fishhook barbs, it is made clear by Willoughby[107] that the bone barb for a certain type of fishhook had a diagonally cut base so that it could be attached at an angle to a wooden or antler shank, the end of which was grooved for its accommodation. Consequently the possibility of all bilaterally asymmetrical bone points with diagonally cut bases being fishhook barbs should be seriously considered. The more nearly straight symmetrical points may have been lashed in the split end of a shaft, i.e. by a fish tail splice. While our museum material from various parts of the world would not indicate that the simple splice was widely used in fastening projectile points, the bifacial asymmetry of the great majority of the simple bone points under discussion appears to render them unsuitable for any other mode of attachment.

In regard to the regional distribution of the simple bone point, it appears to be the most frequent artifact of the shell-heaps of Maine and Nova Scotia. H. I. Smith[108] obtained from the Merigonish Harbor sites 161 specimens of this type, enumerating fragments as well as the more or less complete points.

The relatively great frequency of the simple bone point in the Har-

[105] Smith, W. B., op. cit.

[106] Smith, H. I., op. cit.

[107] Willoughby, C. C., Antiquities of the New England Indians, Publ. Peabody Museum of Harvard Univ., Cambridge, Mass., 1935.

[108] Smith, H. I., op. cit.

TABLE I. OBJECTS OF BONE, TOOTH OR ANTLER FROM THE HARBOR ISLAND SITE

Article	Number	Remarks
Simple bone points	624	For characteristics see text.
Rodent-tooth implements	52	48 Beaver-tooth knives, chisels, etc. 1 Woodchuck- or porcupine-tooth knife. 1 Rabbit-tooth knife. 2 Blunt-ended beaver-tooth markers.
Other types of bone points	47	10 Very small, attenuate, both ends with smooth finish. 7 Hollow bone arrow points. 7 Slender (Comb teeth?). 8 Thick, cylindrical or flattened (fragments of fish spears?). 3 Thick, symmetrical, spindle-shaped. 3 Very long, slender ($3\frac{3}{4}$ to $7\frac{1}{2}$ in.). 3 Odd shapes, with longitudinal grooves, etc. 2 Reshaped from fragments of matting needles. 2 One large, one small bilaterally asymmetrical. 1 Large, wide (probably an unfinished harpoon point). 1 Cylindrical with a square-cut base.
Bone Awls	10	
Bone points with notched or barbed edges	8	
Bone matting-needles	5	One nearly complete.
Short bone needles	3	Of the type of snowshoe needles.
Fragments of large bone implements	3	Polished from use, possibly employed in dressing hides.
Double-pointed bone "markers"	2	One nearly complete, one fragment.
Beamers	2	Made from long bone, incomplete.
Perforated tooth pendants	2	One bear canine tooth, the other a canine of wolf or dog.
Long bone spear point	1	Shank cylindrical, slightly expanded head with a low barb on either edge.
Notched bone grainer	1	
Antler comb	1	Five-toothed. (Several slender points listed elsewhere may represent comb teeth.)
Total	761	

bor Island material is shown by the accompanying lists, Tables I and II. Before preparing these lists, all fragments that could be fitted were glued together; also, those fragments that from special characteristics appeared to belong to a single article were combined, but otherwise fragments were listed as separate artifacts, except in case of pottery, for which only a very rough estimate of the number of pots is possible. Doubtless a considerable proportion of fragments do not represent finished articles, but have resulted from breakage in the process of manufacture; especially would this be the case with fragments of stone objects.

Specimens of simple points occurring to the number of 624 constitute 66 per cent of all artifacts found, and 82 per cent of the artifacts of bone, antler or tooth. Great numbers of these points are to be found in collections from various Maine shell-heaps. In contrast, I have been unable to locate a single point of this type from coastal sites south of Maine. Bone was doubtless used for arrow points in Massachusetts, evidence for which is furnished by Willoughby[109] who describes ten bone points from one of the graves uncovered at Winthrop, some of which showed materials of European origin. From the illustrations furnished, it would appear that these points showed considerable variation in form, cylindrical, flat, grooved and hollow points being represented, but it is notable that all have a square-cut, untapered base so that in this respect they are quite distinct from the characteristic Maine form. Two rather cylindrical points with squarely cut bases were found by the author at a site on Plum Island near Ipswich, Massachusetts. In contrast, only one point of this type occurred in the entire series from Harbor Island.

In the study of collections from various localities in the Peabody Museum, Cambridge, it is difficult to furnish a numerical treatment of the sources of the material, since in some instances only the region rather than the actual site is furnished. As far as may be determined, the Maine material inspected came from about 58 sites and 46 of these furnished specimens of bone points of the type under consideration. Several rather typical, although weathered specimens, catalogued as derived from Casco Bay, were located, and it is quite possible that they might be found somewhat farther southward along the coast if adequate collections were available. None were found in collections from eighteen coastal sites in Massachusetts, and none in collections from coastal sites

[109] Willoughby, C. C., Indian Burial Place at Winthrop, Massachusetts, PM-P. IX–1, 1924.

TABLE II. OBJECTS OF STONE OR CLAY FROM THE HARBOR ISLAND SITE[110]

Article	Number	Remarks
Flaked blades	57	Including objects usually classed as knife blades, spear or arrow points.
Hammerstones	40	Some angular, some smoothly rounded as though worn by trituration.
Scrapers	32	Nearly all of small size, the majority with convexly curved edge, flaked on one surface to a wide angled edge, 5 atypical included.
Adzes	20	Includes complete adzes and fragments readily identified as portions of adzes. Many splinters of pecked stone not included.
Clay pots	15±	A rough estimate based chiefly on localization; since the shards were in most cases found in sites of cooking-fires against rocks.
Sharpened splinters of stone	9	Includes unpecked splinters, flakes and natural strips of stone with end ground to an edge.
Whetstones	2	Flat gritty stones, with one surface showing effects of grinding.
Tobacco pipes	2	An unbroken "platform" pipe[111] of steatite with a highly polished jet black finish, and a portion of a thick-stemmed clay pipe.
Pestle	1	Very heavy, without evidence of use.
Stone "Club"	1	A very narrow stone, slightly pecked, broken into two pieces, deeply dented from side blows.
Rubbing-stone	1	Unshaped stone, one end worn and showing a deep notch in edge.
Total	180	

farther south. Since some of these sites were apparently very carefully excavated, all pieces of bone being retained, it is hardly imaginable that objects of this nature could have been overlooked. Ritchie,[112] in describing material from the Lamoka Lake site in New York, illustrates "double pointed implements" (Plate 17, o–s), which appear to be somewhat similar to the simple bone points of the Maine and Nova Scotia

[110] The following articles clearly attributable to European contact were also found at one border of the deposit: 3 gunflints, 2 steel arrow or lance heads, 3 glass beads, a few fragments of thick glass evidently from broken bottles, and pieces of clay pipes.

[111] This type of pipe is not regarded as a product of the region but is believed to have been introduced through intertribal commerce.

[112] Ritchie, W. A., The Algonkian Sequence in New York, Am. Anthropologist, 1932, XXIV–406.

shell-heaps, although neither terminal fracture nor asymmetry are apparent in his figures. This author includes them with implements of the "archaic Algonkian period". There is, however, no indication of the great antiquity of simple bone points in the Maine shell-heaps, since they are found at all levels in these deposits.

The contrast of the abundance of bone artifacts in Maine coastal sites with their paucity in those farther south is most striking. While bone was used to some extent in Massachusetts, the incidence of worked bone is extremely low in shell deposits as compared with that of artifacts of stone, clay or antler. That this is not based on lack of material is shown by the abundance of bone occurring in such deposits, deer and bear bone being found by the author far out on Cape Cod. Parker[113] states that the early Algonkian period in New York furnishes implements of bone only in a very few sites, an exception being the Lamoka Lake site which yielded about ten thousand bone artifacts. Also, in the third Algonkian period, a considerable amount of bone was employed for awls, harpoons, needles and beads. In the illustrations of New York Algonkian material in an earlier publication, the same author[114] furnishes figures of bone points which resemble somewhat those of Maine shell-heaps. Skinner[115] considers the Algonkian little adept in bone or antler working, and states that articles of such material were always crude and purely utilitarian in character, awls, punches, a few arrowheads of limited types, hide-scrapers, turtle-shell cups, occasional tubular beads and rarely a fishhook or harpoon being encountered. Under Iroquoian influence, "They abandoned much of their beautiful work in stone and revived and enlarged their handicraft in bone and antler". Harrington[116] and Skinner[117] call attention to the abundance of bone articles from the Shinnecook Hills, Long Island site, the former author stating that "barbs suitable for tying on fish spears, were made of bone as were sometimes arrow points". The above references indicate con-

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[113] Parker, A. C., Aboriginal Cultures and Ethnology of the Genesee Country, Proceedings Rochester Acad. Sci., 6: 251–255, 1929.

[114] Parker, A. C., The Archaeological History of New York, New York State Museum Bulletin, 46–50, 1920.

[115] Skinner, Alanson, General Archaeological Criteria of early Algonkian Culture, *in* The Algonkian Occupation of New York, New York State Archaeological Association, Researches and Transactions, 4: 21–41, 1923.

[116] Harrington, M. R., Ancient Shell-Heaps near New York City, Amer. Mus. of Nat. Hist., Anthrop. Papers, Vol. 3, 1909.

[117] Skinner, A., The Lenape Indians of Staten Island, *ibid.*, Vol. 3, 1–62, 1909.

siderable irregularity in the geographical distribution and frequency of bone artifacts in various Algonkian sites and also suggest that bone points similar to those described from Maine may occur occasionally in sites distant from the latter region. While the fact that I have been unable to locate a single point of the type in question in collections from about twenty different sites on the New England coast south of Maine is by no means proof of their total absence, but it at least furnishes a contrasting feature in the material culture of the Algonkians to the northeast as compared with that of contemporary groups of the same stock occupying middle and southern New England.

The bone and antler objects of the Maine and Nova Scotia areas, unlike those of the Beothucks of Newfoundland,[118] show no ornamental carving and seldom any incised designs. Another feature of the Maine shell-heap material which deserves mention is the great frequency of stone adzes. It is the author's impression that more adze blades and adze fragments are to be found in square rods of Maine shell-heaps than in acres of Massachusetts shell deposits. The adze blades vary in workmanship from unshaped, elongate beach stones sharpened at one end, to well-worked specimens. Lacking elaborate artistic qualities, these adzes are commonly ground to very fine edges and would serve as effective cutting implements.

SUMMARY

From the present study, it would appear that the so-called "simple bone point", the most common artifact in the coastal shell deposits of Maine, presents certain features, i.e. bipolar and bifacial asymmetry, together with distinctive characteristics with respect to shape, surface finish, center of gravity and modification by terminal impact, which warrant its recognition as a distinct type. The general occurrence of fracture and dulling of the heavier extremity, such as could be produced only by terminal impact, lends weight to the conclusion that these objects represent projectile points. No other hypothesis as to their nature thus far presented appears to be plausible. The bifacial asymmetry of these bone points is based on the tapering of the posterior portion obliquely so that they could readily be lashed to a shaft by means of a simple splice. Arrows tipped with bone points of similar character and shot experimentally into stony loam and gravel show terminal fractures agreeing in all respects with those which occur so generally in points

[118] Howley, J. P., The Beothucks or Red Indians—The Aboriginal Inhabitants of Newfoundland, Cambridge Univ. Press, 1915.

from the shell-heaps. Points of this type, at least those studied from Maine sites, were not to any notable extent shaped or sharpened by grinding, but were scraped or cut by even, longitudinal strokes of an implement, judged from the striae commonly in evidence to be of stone. In the finishing process, the surface of all except the posterior tapering portion was regularly rendered smooth and polished. Apparently on breakage such points were in most instances resharpened by cutting rather than by grinding, but were sometimes continued in use without resharpening the broken end, the sharp edges of the fracture surfaces being merely rounded off and polished to a variable degree.

Such points occur far more frequently than any other type of artifact in Maine shell-heaps, are represented in great number from Nova Scotia shell sites, but appear not to be represented in typical form in New England to the south of Maine. The great majority of specimens are so shaped that they could be spliced to a shaft in such perfect alignment as to favor withdrawal. This would not be possible with the bone points having untapered square bases, which have been found in Massachusetts. How closely the bone points found in certain Algonkian sites in New York agree with those from Maine has not been ascertained; neither terminal fracture nor asymmetry is apparent in illustrations of the former thus far noted.

A PROPOSED TERMINOLOGY FOR SHAPE CLASSIFICATIONS OF ARTIFACTS

GLENN A. BLACK[119] AND PAUL WEER[120]

IT IS A VERY bold individual indeed who will suggest ideas concerning descriptive methods pointing toward a system for the simplification of classifications for archaeological artifacts. The chief difficulty in the way of arriving at simplified classifications lies in the great diversity of irregular forms. Consequently, the problem becomes so intricate, so full of pitfalls, that one is apt to become lost in a maze of detail out of which there is but slight possiblity of gathering together and properly grouping the essentials.

Whether the subject be axes, celts, gorgets, projectile points or any one of the many groups of artifacts, we must recognize at the very start that there are certain forms which almost defy description. This fact has lead us to search for the basic geometric form of a given object; and then, secondly, to describe its deviation or modification from this basic form with the least possible amount of description.

The great need for such a plan made itself first apparent in our work on gorgets. Several hundred of these were rearranged into the groups and sub-groups of the "International Classification". We were immediately confronted with the spectacle of an appallingly large number of forms that did not fit adequately into the classification: that is, the general classificatory term was not enough to give a proper mental picture of the object. We discovered that this inadequacy in classification was due to a lack of proper descriptive terms from the modifications of geometric forms.

Before proceeding with this problem, we made a careful search for something entirely new as a method of classificatory approach. This finally resulted in confirmation of the geometric nomenclature adopted by Dr. Warren King Moorehead and his committee when the "International Classification" was developed. The knowledge that such a plan as we had in mind should be worked out on the geometric principle led us to present to certain institutions, and to individuals qualified to be helpful, this question: Is there an industry or an art that has developed a classified nomenclature for certain irregular geometric forms

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[119] Archaeologist, Indiana Historical Society, Indianapolis, Indiana.
[120] *ibid.*

which occur both in nature and as the result of man's handiwork? A very diligent search revealed the fact that no such work had been done, while the general response with the suggestion that it should be done was of surprising interest to us.

With this much behind us, the next step was to let the objects themselves do most of the talking. As we worked with an artifact this thought was always foremost in our minds: How may this object be most briefly described in a manner that will be readily understood by others? This has been a long, grueling process, but it has had its rewards for the artifacts themselves have become articulate in showing us similarities in apparent dissimilarities. Through a unified method of describing modifications, we gradually began to see greater uniformity in basic forms. The plan as it developed soon outgrew the single problem of gorget forms, for we discovered an interrelationship between these and other artifact forms, the classifications and descriptions of which gradually and naturally assumed this new relationship to the modificatory terms; this for the very adequate reason that the terms apply to any and all geometric forms wherever they are found either in nature or as the result of special treatment and change by man. Our work is not final in any sense of the word, and the results are not one individual's observations, but rather the accumulated developments and refinements of our co-workers and numerous friends. The process is still going on, for we are continually seeking for fundamental simplicity. The multitude of variant forms has not been allowed to carry us into a highly complicated system, and if we have erred on the side of simplicity, possibly that is a good fault. What we have attempted to do is most certainly subject to friendly and constructive criticism, for we are interested in one purpose only, that of making available for our friends and co-workers in archaeology, as also for anyone in the arts and industries who may have occasion to use it, a generally recognized classificatory nomenclature for irregular geometric forms.

The basic, flat, geometric forms are the circle, the triangle and the square: one continuous line, three lines and three angles, and four lines and four angles, respectively. Other forms are either combinations or variants of these. Without thought of so doing, and at the very beginning of our work, we automatically dropped the term "variant" and substituted the term "modification". Strangely enough this seemed to be the key to our problem, for while so many artifacts were basically rectangular or triangular, the slight modifications worked into the finished objects so altered their forms that to say this was a rectangle,

that a triangle, and so on, appeared to be a very inadequate and oftentimes incorrect description of the artifact. But there the object was as large as life itself, a modified rectangle or the modification of some other form as the case might be. This situation was met by providing the terms: *rectanguloid*—meaning rectangular-like; *trianguloid*—triangular-like; *circuloid*—circular-like.

This at once indicates a modification of the basic form. In this connection, it is important to say that there may be times when it is quite sufficient for the purpose in hand to say that a celt is rectanguloid, a projectile point trianguloid, or a gorget circuloid, and let it go at that. If, however, as is generally the case, it is important to more fully describe the shape of an artifact, a group of modifying terms which have a definite meaning may be used.

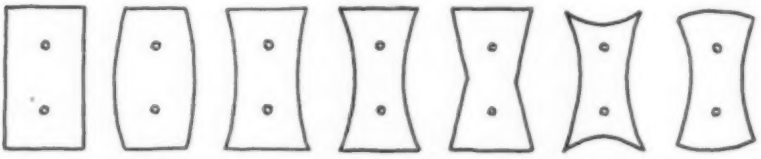
We are of the opinion that the best way to explain these modificatory terms is to present them with pictorial examples.

The greatest diversity of form is probably to be found in the flat gorgets.

GORGETS

There are two methods for saying the things we wish to say, one of which is that of a general treatise on methods for describing modified geometric forms with the application to groups of objects supplemental thereto. The second method is to actually work out the modifications in terms of a concrete problem, and then later to catch by inference the larger picture. We believe this second method is much clearer, less tedious, and has the added advantage of very definitely showing the applied terms as they fit a concrete problem. With gorgets, we are dealing with types familiar to all archaeologists; and so, without further descriptive background, we are ready to proceed with our problem.

RECTANGULOID FORMS

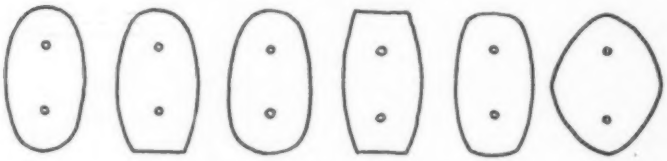


R-1 R-2 R-3 R-4 R-5 R-6 R-7

Many so-called rectangular forms are not true rectangles; that is, having four sides and four right angles. Figure R-1 is a true rec-

tangle or rectangular form, but to describe R-2 we must consider the modification of the sides which do not join the ends at right angles. The term "rectanguloid", that is rectangular-like, conveniently indicates that our figure is a modified rectangle. The slight outward curve of the sides is described as excurvate. Therefore, figure R-2 is described as *rectanguloid—sides excurvate.* In figure R-3 the sides are curved slightly inward, so R-3 is *rectanguloid—sides incurvate.* Figure R-4 is a well known gorget form for which new terminology is not required, with the exception of the term rectanguloid, thus: *rectanguloid—sides concave.* It is of interest to note that a figure with convex sides is not shown, for we have discovered a more correctly defining term for this form, as will be shown later (figure E-4). In R-5 the sides are modified not as curves, but with angular lines; this form is therefore described as *rectanguloid—sides constricted.* In R-6 we have concave sides and concave ends, described as *rectanguloid—quatre-concave.* R-7 is *rectanguloid—sides concave, ends convex.* Here we have the maximum modification to which a rectangle may be subject. It very closely borders on the panduriform (p. 285), but is nevertheless most certainly rectanguloid.

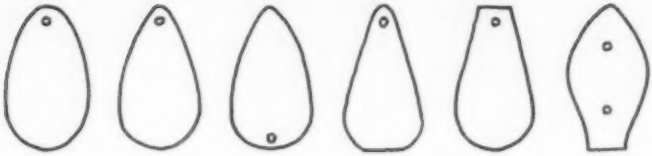
THE ELLIPTICAL FORMS



E-1 E-2 E-3 E-4 E-5 E-6

The curvilinear symmetry of its sides indicate an elliptical form. Figure E-1 represents the elliptical form, unmodified; it is simply *elliptical.* In E-2, however, while we have a basically elliptical form, one end has been cut off by a straight line. This of course is a truncation, so we suggest describing E-2 as *elliptical—monotruncate.* If instead of truncation one end has been flattened or blunted, as in E-3, the term oblate exactly describes this modification, and therefore E-3 is *elliptical—monoblate.* If both ends be truncated, as in figure E-4, we have an *elliptical—bitruncate* figure; flattened or blunted, as in E-5, an *elliptical—bioblate.* There are elliptical forms which approach a circle, as in E-6, *hyperelliptical.*

THE OVAL AND OVATE FORMS



O-1 O-2 O-3 O-4 O-5 O-6

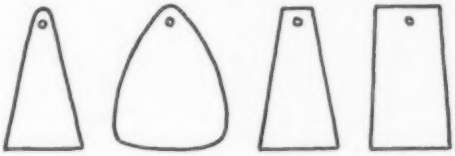
The oval form is represented in figure O-1, and the ovate in O-2. Here we are following the distinction in leaf terminology, the oval with its egg-shaped apex, and the ovate pointed at the apiculate end. The perforation in both O-1 and O-2 is at the apex, described as apicular perforation. The listing of the first three figures follows: O-1, *oval—apicular perforation;* O-2 *ovate—apicular perforation;* O-3 *ovate—basal perforation.* O-4 is an interesting form widely distributed in nature, and found in several archaeological artifact groups. Here is a form which deserves special treatment. It is most certainly an ovate with a truncated base. We discovered that the word "cuneal", meaning wedge-shape, as a modifying term to ovate, gave us the combination. Cuneal-ovate, we believe, clearly and adequately describes this form. Therefore, in describing O-4 we have a *cuneal-ovate—apicular perforation.* O-5 is an *oval* or *ovate,* whichever you may wish to call it, with *truncate apex* and *apicular perforation.* Occasionally there may be such a form as a cuneal-ovate with truncate apex, but a figure of this nature is usually more correctly described as an *ovate-oblong—sides excurvate,* as will be shown in connection with trianguloid forms (figure T-R-4). O-6 is an *obovate—truncate base.* Obovate means "reversed egg-shape; having the broad end upward or toward the apex". Oblation is not a modification for the oval and ovate forms, with the single exception that an ovate with oblated apex is of course an oval.

There is another fact concerning the oval and ovate forms which should be taken into consideration. Quite often we find artifacts of these forms with bodies the sides of which for a portion of their lengths are almost straight. In such a case the word "linear", *linear oval* or *linear ovate* as may be required, conveys a proper mental picture of this proportional relationship.

THE TRIANGULOID FORMS

Figure T-1 is a regular *triangle* with *apicular perforation.* Figure T-2 is the deltoid form of the triangle, and in this figure the two sides and

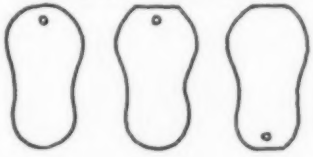
base are excurvate. Therefore, T-2 is described as *trianguloid—deltoid form, tri-excurvate, apicular perforation.* T-3 is *trianguloid—truncate apex, apicular perforation.* T-R-4 is a very well known and often repeated form among archaeological artifacts. We were able to find a regular dictionary word to describe it: *ovate-oblong.* An ovate-oblong is an oblong having one end broader than the other. In this word combination "ovate" is a descriptive adjective. The wider end is the base; the narrow end, the top. Therefore, it is a rectanguloid form basically; but we have shown it here with the trianguloid forms to emphasize the dif-



T-1 T-2 T-3 T-R-4

ference between it and figure T-3. The ratio of convergence of the sides is the distinguishing feature between T-3, a trianguloid with truncate apex, and T-R-4, an ovate-oblong. Once this distinction is noted, there will be very little if any confusion between the two forms. The previous classification of ovate-oblongs as rectangular caused us much consideration until the new term was discovered; and this discovery fathered the suggestion that these modificatory terms could be used for other types of artifacts: for example, it supplied new terminology for a common variety of celt which we were now able to classify as *ovate-oblong—sides excurvate, elliptical in cross section.*

THE PANDURIFORMS

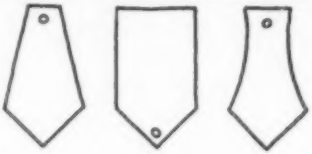


B-1 B-2 B-3

A panduriform is "an obovate with a concavity on each side, like a violin; fiddle-shape". There are many large, thick gorgets of this form and, with the reminder that as an obovate the apiculate end is the larger we have: B-1, *panduriform—apicular perforation;* B-2, *panduriform—*

truncate apex, apicular perforation; B-3, *panduriform—bitruncate, basal perforation.*

PENTAGONAL AND OTHER SEVERAL-SIDED FORMS

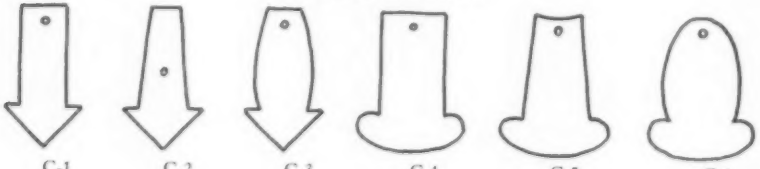


P-1 P-2 P-3

Gorgets with pentagonal shapes, such as illustrated in figures P-1, P-2 and P-3, have usually been classified as shield-shaped. This does not convey a definite picture by reason of the fact that a shield may have any one of many shapes: circular, square, rectangular, elliptical, and so on.

In classifying and describing these forms, we have taken into consideration the number of sides and the geometric pattern they make. Figure P-1 is *pentagonal—ovate-oblong, pointed base, perforation at the top.* In P-2 we have a *pentagonal—rectanguloid, one end straight, reverse pointed; perforation at the point.* P-3 is *pentagonal—ovate-oblong, incurvate sides, base pointed, center perforation.* A variety of modifications may be found in these forms, subject to terms already outlined. Furthermore, if the figure be six-sided it is *hexagonal;* the same principle holds for figures with other numbers of sides as the case may be. In any case the description indicates the number of sides and the basic geometric forms they assume, with modifications.

COMPOUND FORMS

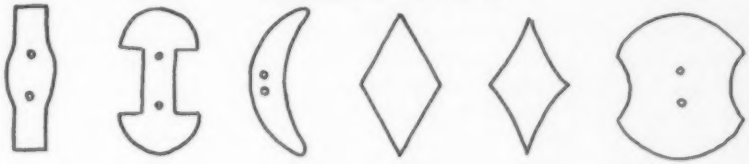


C-1 C-2 C-3 C-4 C-5 C-6

Closely following the classification of pentagonal forms, which indicates the wide range of modifications which can be briefly and graphically catalogued, we have here a group of compound forms for which it is necessary only to give the application: C-1 is *rectanguloid—one end*

forming sagittal point, reverse straight; perforation at straight end. C-2 is *ovate-oblong—sagittal base, center perforation.* C-3 is *ovate—truncate apex, sagittal base, apicular perforation.* C-4 is *rectanguloid—one end forming a lunate, reverse straight; perforation at straight end.* C-5 is *ovate-oblong—lunate base, excurvate top, top perforated.* C-6 is *oval—lunate base, apicular perforation.*

MISCELLANEOUS FORMS



M-1 M-2 M-3 M-4 M-5 M-6

Above are illustrated a group of miscellaneous forms which are found in practically all gorget collections. M-1 *expanded-center* type, 2 *perforations.* No attempt has been made to change the name of this well-known artifact form. Attempted classifications of the M-2 form have always been rather obscure. We have gone to the bannerstones for a descriptive formula: *round-wing bipennate tablet, 2 perforations.* M-3, *lunate—tablet form, 2 perforations.* M-4 *rhombus—tablet form.* M-5 *rhombus—tablet form, quatre-incurvate.* If the sides of M-4 or M-5 be of unequal length, the forms are rhomboids. M-6, *circuloid—2 opposing equi-concavities, 2 perforations.*

In the preceding pages we have outlined a method for gathering together in a classificatory plan the modifications found in irregular geometric forms. We have been dealing with two manifestations of the line: a straight line and a curvilinear line. These may be pushed either inward or outward, or cut off; in all cases modifying the shape of the object which the line or lines bound, each line entering into a new relationship with other lines in the same plane. To provide a group of terms to describe these changes and their effect upon the object was our first purpose. This has made it possible, we believe, to now suggest a simplified classification for the group of objects to which these artifacts belong.

We wish to emphasize a suggestion made on a previous page that it may not always be necessary or even advisable to describe all modifications present in an artifact, but when and if this is advisable, a method is available. In this connection, it is becoming increasingly more important to show these modifications in archaeological literature because we

are discovering that slight differences in the form of an artifact often denote widely divergent cultural affinities. The discovery in our workshop that all Adena type gorgets have counter-sunk perforations, and that this is practically an exclusive trait of the Adena objects as compared with those from other sources, is but a different aspect of the same problem, and has not been neglected in our classificatory plan.

THE GORGET CLASSIFICATION

The Gorget Classification consists of three main divisions: I—Geometric forms; II—Morphological forms; III—Culture forms. The use of the organized group of modificatory terms which we have presented makes it possible to describe an artifact as minutely as may be desired. In Division II—Morphological forms, the shape of an artifact is so well known that it is not necessary to qualify it unless there be some unusually distinctive modification. For example, the *expanded-center* gorget is so well known as a type that it is not necessary to describe its geometric form. If the ends of an artifact of this form are incurvate or concave, or if the centrum periphery is oblate, or the flat surface longitudinally ingrooved, description as such is a matter to suit individual requirements; but certainly "expanded center" conveys the essentials as to the shape of the gorget. In Division III, culture forms carry us a step further away from a geometric classification, as for example: *Folsom point*. It is not necessary to describe this object geometrically, nor even morphologically. It is a culture form and no description is necessary except as and when altered to modify the accepted form. As time goes on and knowledge grows, the classification of artifacts will progress through divisions I and II to Division III, where their cultural relationship to other objects will be indicated.

Classification of Gorgets

I. Geometric forms.
   1. Circuloid
   2. Elliptical
   3. Oval or Ovate
      A. Cuneal-Oval or Cuneal-Ovate
   4. Rectanguloid
      A. Ovate-Oblong
   5. Trianguloid
   6. Compound
   7. Miscellaneous

A. Bipennate
B. Lunate
C. Unusual
D. Specialized
E. Asymmetrical

II. Morphological forms
1. Expanded Center
2. Panduriform
3. ————

III. Culture forms
1. ————

CELTS

In dealing with celts we get away from flat objects, with rare exceptions, and must consider both outline and cross section. For example, the following terminology will describe literally millions of celts: *ovate-oblong, quatre-excurvate, rounded corners, elliptical in cross section.* It may be that the classification "ovate-oblong" is all that is necessary. If so, well and good. If it is desirable to give additional description, it may be done with a minimum of effort and confusion. If to the above description is added the material of which the celt is made and its measurements, a complete mental picture of the artifact is provided.

Before suggesting a classification for celts, there are a few things that should be said. First, concerning the descriptive term "rounded corners". After much effort we have failed to discover anything that so simply conveys the idea. It is a good archaeological term and good geometry. We are not interested in adding anything new that can be avoided.

However, the terms "elongate" and "linear" should be fixed. These have particularly to do with elliptical and oval or ovate forms. An ovate, for instance, may be long in proportion to its width; this should be described as an *elongate ovate.* Or the object, although basically ovate, may have rather straightish sides; this would be a *linear ovate,* conveying the idea of sides (edges) that for a portion of their length are almost straight. There are many archaeological artifacts, especially among the celts, projectile points and blades, that require the use of these modifying terms in order that the description may permit one to visualize their shapes.

The well known cross-section descriptive term, *one surface flat, reverse convex,* which applies to so many celts, cannot be improved. We have no suggestions concerning the descriptive term, *beveling.* Nothing

good that has been done during the arduous years of the past should be lost. We should like to assist in bringing all such terms together and in standardizing their use. The celt classification is basically the same as the gorget classification. If we are to make progress, many of the geometric celt forms will become morphological forms, and some may become culture forms as we become better acquainted with their associations.

Classification of Celts

I. Geometric forms
  1. Elliptical
  2. Oval or Ovate
    A. Cuneal-Oval or Cuneal-Ovate
  3. Ovate-Oblong
  4. Rectanguloid
  5. Trianguloid
  6. Compound
  7. Miscellaneous
    A. Unusual
    B. Specialized
    C. Asymmetrical

II. Morphological forms
  1. ————

III. Culture forms
  1. ————

BLADES AND PROJECTILE POINTS

We fully expect and are prepared to withstand much pressure on the subject of a simplified classification for blades and projectile points. We are convinced there is a natural meeting place somewhere between Thomas Wilson's encyclopedic classification and the ultra-practical classifier's division of these artifacts into three groups: triangular, stemmed and leaf-shaped. As a matter of fact we do not agree to the latter classification at all, because "triangular" refers to morphological form, "stemmed" does not refer to a basic form at all but rather to a secondary feature to some basic geometric form, and "leaf-shaped" can mean any one of several forms, just as did "shield-shaped" with gorgets.

Generally speaking, "blades" includes the larger artifacts: knives, spearpoints, ceremonials, and all forms with two points. As a more or less arbitrary rule, the projectile points are, of course, provided with one point and are usually five centimeters or less in length. This matter

of distinguishing between the type names for various forms is very largely a matter of personal judgment and at once suggests an interesting problem: the infinite variety in blade and projectile-point forms, from the crudest of objects to the finest of beautiful and intricately worked objects. Three factors governed this: time, the material and the skill of the workman. It is not necessary to more than suggest this, and leave it with the thought that a fine piece of flint in the hands of a master chipper, who had time to do the job, produced a beautiful or useful object. Many a worked flint is neither beautiful nor useful, nor ever was to its original owner. Therefore, we suggest a division into three classes:

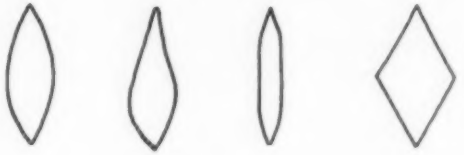
C—Crude,
B—Finished,
A—Exceptional.

Not that it is necessary or even advisable to always designate a blade or a projectile point as a "C", "B" or "A" type, but there are times when this division may be helpful; for example, when working with a large group of artifacts from one site, or when cataloguing a substantial quantity. This is a class distinction entirely aside from the general classificatory plan.

Preparatory to presenting our proposed classification, let us say that we have no suggested changes for describing *barbs*, *bevels* and *serrations*. We believe that our threefold general classification adequately covers the requirements for blades and projectile points: I—Geometric forms; II—Morphological forms; III—Culture forms. In describing geometric forms, the modificatory terms shown in earlier pages are equally useful here. When a geometric term is used to classify a morphological form, it is something more than simply a geometric term. It implies an archaeological background which has given to the term certain very definite connotations, and usually implies more or less general culture affinities which as yet are not specifically determined. Whether the descriptive term applied to a culture form be geometric or otherwise, it indicates a very definite culture alignment.

Returning to the first classificatory group, geometric forms, we have two main sub-groups: 1. with two points; 2. with one point. In the term "with two points" we have broken up the former "leaf-shaped" class into four types, including the three standard "leaf"-classifications forms: *elliptical* (a), *lanceolate* (b), and *linear* (c), and adding *rhombic* (d).

These forms are subject to the modifications already outlined. In sub-group 2, "with one point", we are convinced there are but two classes: A—ovate or oval; B—trianguloid. We must select something basic. Inasmuch as these objects have one pointed end we shall have to consider an expanding body traveling away from that point, the body bounded by two edges which form straight or curved lines, or their



modifications. The cutting off or bounding of the base is accomplished in the same manner. The modifications have already been described, with this exception: we must consider that the lines may be indented or notched. These notches may be in the sides—*sides notched*, in the edge-base corners—*corners notched*, due to breaking off of the edge-base corners—*corners removed*, in the base—*basal-notched*, or in the form of a specialized indentation in the base—*bifurcated*.

We are still endeavoring to classify a modified geometric form and, inasmuch as the artifact has but one point, it must be basically either ovate or oval, or trianguloid. This is the case, for if one picks up at random any blade or projectile point, unless it be of an extremely crude "C" form, an asymmetrical form or a compound form, its geometric or modified geometric form will at once (or after a little practice) be seen. The form of the notches or their placement does not alter the basic geometric form.

We believe that the basal portion of a point is of primary importance as a culture trait. The notches and stem served to prepare the base for hafting after the manner of the cultural standards of the implement's maker. The notching either did or did not provide a stem; or, by the same taken, to provide a culturally correct stem the notching *had* to be done after a manner effecting this result.

However, merely to classify an artifact as a stemmed point does not tell enough of the story. To say that a given point is an *ovate, corners notched* (Pt-1), automatically conveys the idea of a stem; or that a point is *trianguloid, corners notched* (Pt-2), or *trianguloid, corners re-*

moved (Pt-3), gives us the picture of stemmed objects and, in addition, some conception as to their forms.

We are stepping on dangerous ground with our eyes open and, lest we be misunderstood, one should remember that there are exceptions to every rule. We believe there are artifacts in which the stem appears to lie outside the geometric figure. For example: *trianguloid, with basal stem* (Pt-4); a terminology which we believe not only presents a clearer picture, but also a more correct geometric description, for here we have

Pt-1 Pt-2 Pt-3 Pt-4 Pt-5

no need to search further for our geometric form. The matter of describing the stem, expanding, straight, or contracting to a point, may be carried on to suit the needs of the classifier. There is the form in which the straight stem-end suggests classification as trianguloid, corners removed (Pt-5), but we believe that the term: *trianguloid, with stem*, is a truer geometric description. This does not destroy, but rather strengthens the general plan.

In other words, the term "stemmed point" is not enough; we must be able to visualize the picture of the base. We know this is contrary to the historical technic of archaeologists, but we are more and more convinced that one cannot tell much about the base until one has an idea of the geometric form of the artifact as a complete object.

We place "triangular points" under morphological forms. Archaeologically speaking, a triangular point is more than simply a geometric description. "Folsomoid"[121] is also a morphological form, while "Folsom" is, of course, a culture form.

Classification of Blades and Projectile Points
Divided into three classes
C—Crude
B—Finished
A—Exceptional

[121] After these figures were written, we discovered that the word "Folsomoid" had been used by Frank H. H. Roberts, Jr.: A Folsom Complex, Smithsonian Miscellaneous Collections, Vol. 94, No. 4, p. 7, 1935.

I. Geometric forms
  1. With two points
    A. Elliptical
      a. Hyper-elliptical
    B. Lanceolate
    C. Linear
    D. Rhombic
    E. Miscellaneous
      a. Unusual
      b. Specialized
      c. Asymmetrical
  2. With one point
    A. Ovate or Oval
      a. Cuneal-Ovate or Cuneal Oval
    B. Trianguloid
    C. Compound
    D. Miscellaneous
      a. Unusual
      b. Specialized
      c. Asymmetrical

II. Morphological Forms
  1. Triangular
  2. Folsomoid
  3. ————

III. Culture Forms.
  1. Folsom
  2. ————

ARCHAEOLOGICAL PROBLEMS IN THE SOUTHERN CALIFORNIA DESERTS

ELIZABETH W. CROZER CAMPBELL[122]

DURING years of painstaking work in the California Desert certain types of flint implements seem to have occurred again and again. Our work is now carried on with two main objectives: one to cover all likely areas where sites might be found, the other to try to discover if cultural groups follow certain geologic formations and if so, to place these types in their proper sequence, all of which is no very simple task. With these two main objectives in view, it is proposed to scour the more arid region of southern California, with the idea that any solution of the problems connected with this territory may prove a possible clew towards unraveling the story of prehistoric man in wider portions of the Great Basin, which we hope to explore in the future.

That many of the sites which contain nothing but flint and stone objects are ancient is becoming more and more apparent, and it is to be hoped that a thorough study of their relation to their topographic situation will ultimately throw light on placing types in their proper order, and possibly on their approximate antiquity. That it is difficult to bring forward convincing proof of antiquity where there is no stratification we are well aware, though the task does not seem hopeless by any means, and it is expected that a conscientious recording of conditions connected with all sites which appear to be old will ultimately speak for itself and tell a clear story. After all, surface finds of stone objects resting upon terraces in the Old World have managed to acquire a hoary position in the age scale, and we are satisfied that the very nature of sites in our desert terrain will eventually cause forms found thereon to be placed where they rightfully belong, be it old or young. As a matter of fact, we are searching not for great antiquity but for the truth as it may be revealed, and should we be so fortunate as to be able to place various styles of flint implements in their proper order, we will feel that our time and work will not have been spent in vain.

Here in the desert many kinds of archaeological sites are present, from late Indian camps still strewn with arrow points, potsherds and perishable objects, to older camps, far from water, where nothing but

[122] Director, Southwest Museum Laboratory, Twenty Nine Palms, California.

flint and stone objects remain. During eight years of work thousands of late sites have been found, but these are usually grouped about recent or present-day water holes. A few sites contain mixed cultures, but as a whole they run obligingly true to form and produce only those types we have learned to expect under a given set of conditions. Some few arrow point-potsherd sites exist about playas of recent origin or near dried water holes, but most of these sites have water today for short periods following heavy storms and could be occupied at times, even yet, were Indians in the vicinity.

Older playas with wave-cut cliffs, terraces and strand lines harbor sites that yield dart points, scrapers, gravers, choppers and knives, and do not produce manos or metates. Extinct rivers similar to the one we have already described[123] have an old culture along their shores, and occasionally some of the quarries have sites abounding in old flint forms. Pleistocene lake shores occur far beyond present shores of playas, and again where no playas are, and all these features must be examined and searched for remaining evidence.

In the Mohave Desert most of the fossil lakes mentioned by geologists occur along river courses where water flows above ground after wet seasons. This permits the argument that nearby terraces could have been used in late times. Therefore, in searching for pure sites on old shores, camps must be found far enough from water to preclude any such assumption, and terraces must be discovered high above the present level of the plain. Here many difficulties arise, for in an arid region cloudbursts tear out terraces, alluvial fans bury them and detritus borne downwards from steep slopes obliterates beaches and strand lines. Nevertheless, despite the destruction of storm and wind, sheltered places do exist where terraces, banks and beaches still remain preserved, and extinct river channels occasionally retain their banks in protected areas, where old camps may be found for miles.

In the Pinto Basin there lies an extinct river, and along its banks we found, for nearly six miles, camps containing a culture different from anything we had previously encountered. All artifacts ran so true to type and were so unmixed with any other class that we were convinced that this was a definite culture and would in time be found elsewhere, which has since proved to be the case. Competent geologists seem to have established beyond doubt that the five and one-half miles of occupation border the banks of an old stream and not a lake or sink. Here

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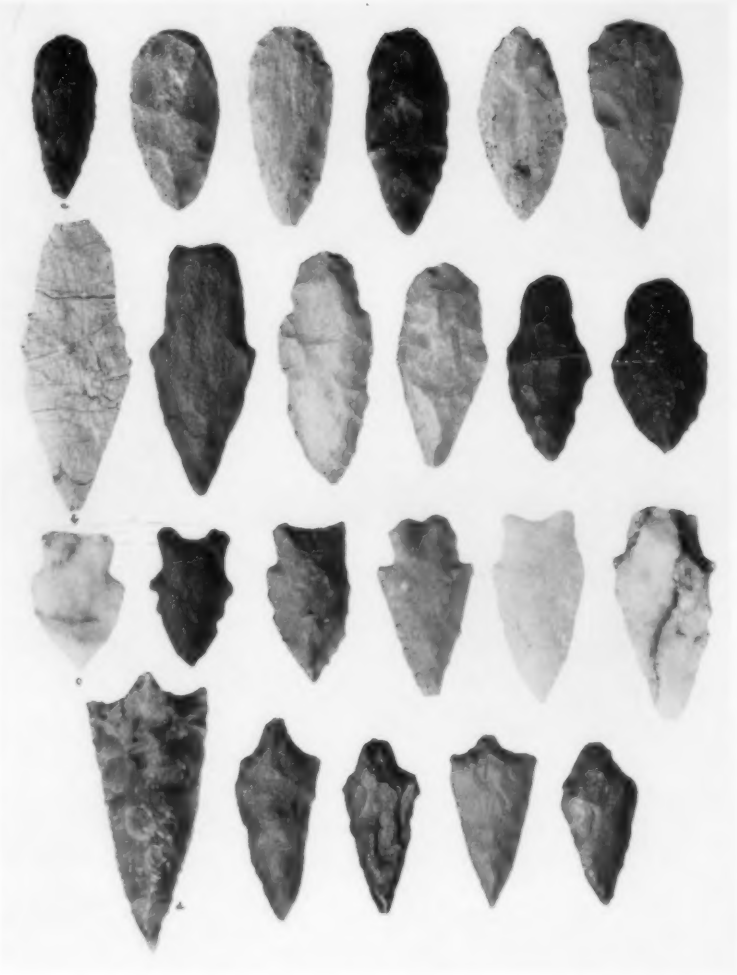
[123] Campbell, Elizabeth W. Crozer and William H., The Pinto Basin Site, Southwest Museum Papers No. 9, 1935.

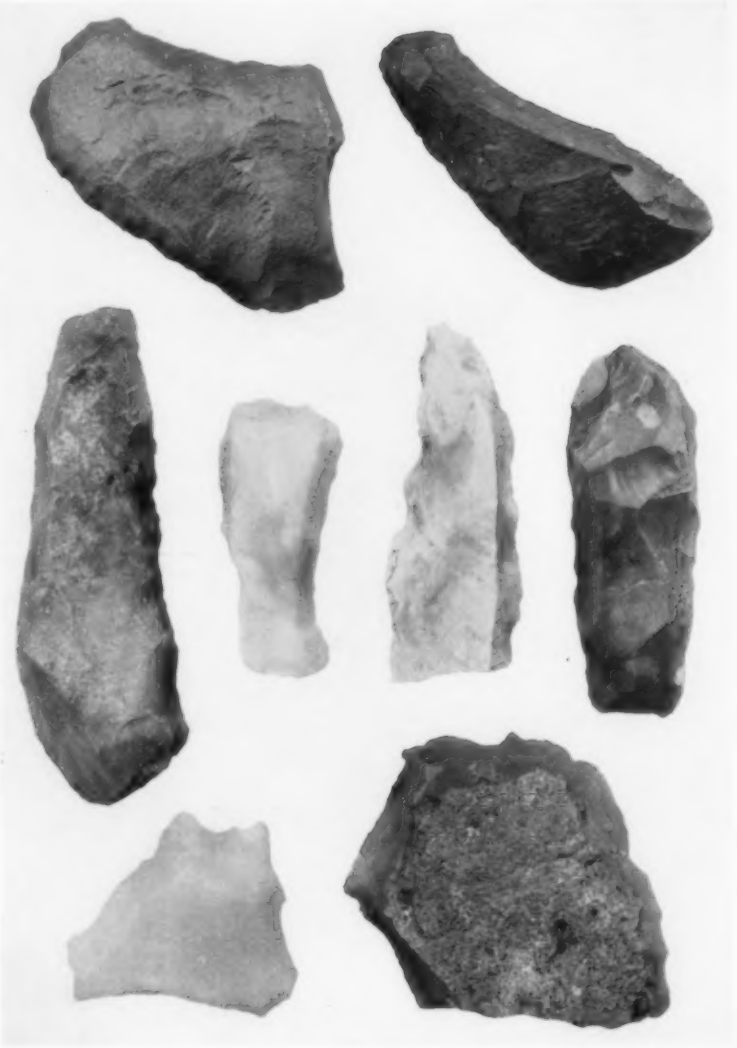


California Desert points: (a) Leaf-shaped points; (b) Silver Lake points; (c) Pinto points; (d) Gypsum points. Largest dimension 78 mm.

Keeled or turtle-backed scrapers. Largest dimension 79 mm.

Choppers (a) and side scrapers (b). Largest dimension 124 mm.

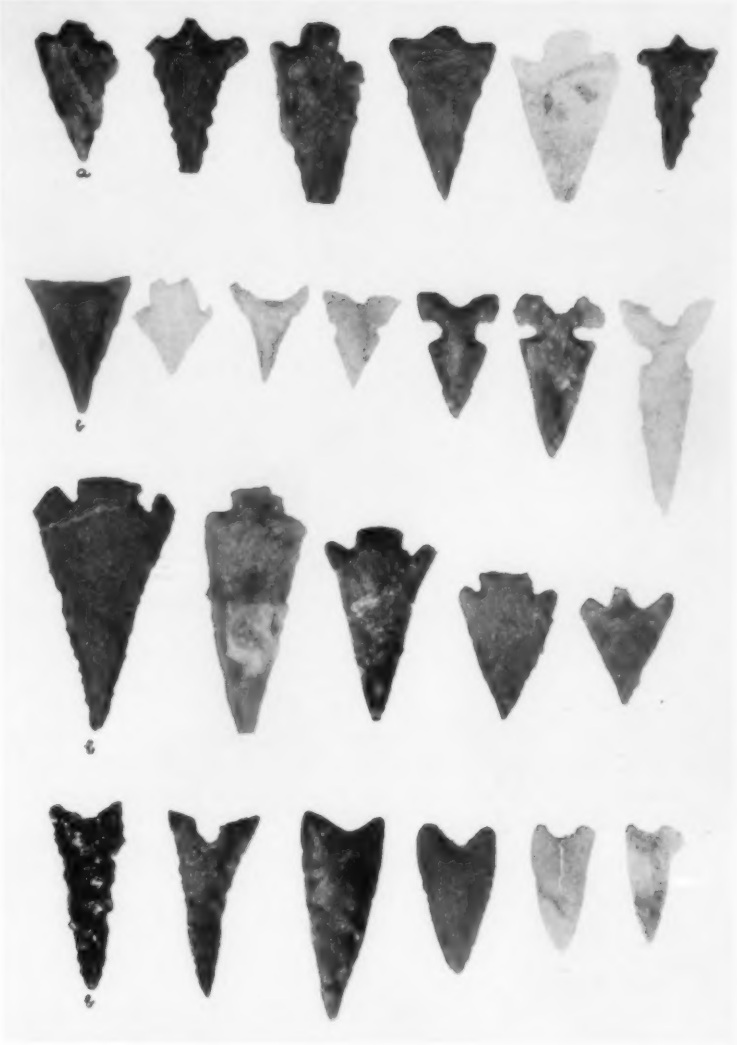
Gravers. Largest dimension 60 mm.



Gravers. Largest dimension 60 mm.

Small thin scrapers of the retouched-flake type, with no flaking on the reverse side. Longest dimension 83 mm.

Big Blades. Longest dimension 90 mm.



Arrow points: (a) from non-potsherd camps; (b) from potsherd camps.
Longest dimension 44 mm.

Unclassified forms of projectile points. Longest dimension 60 mm.

occur projectile points of the Pinto type, much too large and heavy to be considered arrowpoints (Plate 20, c), leaf-shaped points (Plate 20, a), keeled and side scrapers (Plates 21; 22, b), choppers, gravers (Plate 23) and retouched flakes (Plate 24). Manos and metates are also found and seem to be associated with the Pinto type of point.

Above the shore line of Old Lake Mohave Mr. Campbell discovered terraces sixty feet above the present lake flat, back of which we encountered a very distinct culture. Here on the surface were dart points with a rounded base (Plate 20, b), keeled scrapers (Plate 21), gravers (Plate 23), retouched flakes (Plate 24) and large knives, all very much weathered and smoothed by sand-blasting, and mostly found near grouped stones suggesting hearths. No manos or metates were found on this site. Possibly the absence of these, the extreme sandblasting of the objects and the fact that the scrapers more definitely resemble old European forms than those on the Pinto Basin site, have led us to think that these types, first discovered here and for that reason named Silver Lake culture, may possibly antedate the Pinto Basin specimens. Similar dart points (Plate 20, b) were found along the old Pinto River but it is interesting to note that all but one of them came from one district on the south shore of the stream, and no manos or metates were found for hundreds of yards about.

In the desert ten miles west of the writer's home in Twenty Nine Palms, another river course was discovered by Mr. Donald Curry and Mr. Charles Amsden. Here again Pinto points (Plate 20, c) were found accompanied by the same artifacts associated with them in the Pinto Basin. This dry stream bed emerges from a large playa and descends gradually across the desert to terminate in another sink five hundred feet lower in altitude than the first. Along the western part of the stream the Pinto culture appears at many camps, and farther along this same watercourse Silver Lake-type camps are found. On an old clay bank near the central portion of the stream one camp was discovered containing flint flakes, two broken keeled scrapers and the base of a Gypsum-type point (Plate 20, d). A few leaf-shaped points occurred with the Pinto culture at the western part of the river (Plate 20, a).

Fifty miles north of Barstow Mr. Campbell found what appears to be another extinct stream, and again Pinto culture was found to line the banks of a dry river bed. At this place there may be a chance of classifying cultures according to their levels, for Pinto (Plate 20, c), Gypsum (Plate 20, d) and Silver Lake (Plate 20, b) types were found to occur, but in separate places and apparently at slightly different altitudes. There was a fine outcrop of flint rock here, so the district no

doubt drew people because of the quarry as well as the river. Pinto camps were, as elsewhere, sprinkled with manos and metates though the Silver Lake culture, on a seemingly higher level, was entirely devoid of such objects. Pinto camps lay to the west, Silver Lake sites to the east, and midway between the two was a small camp containing five Gypsum points (Plate 20, d) but no polished stone objects.

Pinto points are found back from the shores of Dale Dry Lake and here, if anywhere, they might have been associated with a lake and not a river. However, the chain of lakes along the Lucerne-Dale Trough might have been part of a river system, as each playa encountered is lower in altitude than the one preceding, Dale being the lowest. There is a very deep deposit of salts beneath Dale Playa, so possibly it has been saline for many years and the Pinto Basin people in the next valley may have come here to obtain salt.

Gypsum points (Plate 20, d) have been found on five different sites, but so few have been recovered in any one place that we have not been able to associate any other definite types of flint or stone objects with them.

Another variety of camp appears, strewn with quantities of crude, heavy blades (Plate 25), and is associated with manos and metates again but produces no dart points. So unfinished do these blades seem that were the sites anywhere near a quarry we would certainly call the objects blanks, but they mostly occur quite far from any flint outcrop. Nothing besides manos and metates are found with them and these, unlike the blades, are exceedingly well made. In a few instances these Big Blade camps are found near quarries, but mostly they are near the shores of dry lakes, none of which are listed by geologists as Pleistocene lakes of the region.

On camps producing late potsherds, arrow points of all of the usual desert forms occur (Plate 26, b), and there are non-potsherd camps that also have arrow points of a somewhat different shape (Plate 26, a), slightly resembling a Gypsum point at the base, though not over an inch in length. Do the Big Blade people follow next in the sequence, or shall we find other forms between?

Many problems arise to which we have not yet found answers. Are the leaf-shaped points, occurring on Pinto sites, an unfinished attempt at some other form, or shall we some day find a series of camps containing no other points but these? Why do Silver Lake types occur on rivers with Pinto culture, but Pinto points not appear on terraces with the opposite types? We have found Gypsum points thus far in five widely separated districts; where should they be placed in the series? Will the Pinto people continue to appear along river channels, or will they be

encountered near playa shores or at sites suggesting dried springs? Perhaps we will find new types that will change all preconceived ideas.

Fossil bones of extinct animals such as camel, horse, bison and mammoth have been found on old camp sites. Thus far these seem to be scattered about the camps, are not deeply embedded in the clays and do not occur beyond the camping areas. Is it just chance of circumstance that man and extinct beast appear on the same camp sites, or shall we some day find unmistakable evidence of association between the two?

Here in a great desert area we have problems of sufficient importance to focus all of our energies upon a possible solution. Perhaps endless searching and hard work will one day reward us with a series of terraces or levels where at least some of our cultures will appear in their proper sequence. Certainly many of the sites we encounter could have been habitable only if a moister climate had produced springs and flowing rivers, and filled lakes that are recognizable today solely by their clays and faint shore lines. An extensive survey is being carried forward in the seventy odd basins of the territory mentioned above. Besides this, we shall have to explore the shores of more than a dozen Pleistocene lakes in the region, and whenever old river channels can be found, their shores must be followed and searched to find any existing culture.

Anyone unfamiliar with the topographical features of the arid portion of this part of the state, lacking roads or settlements, can scarcely realize the tremendous difficulties attendant upon the exploration of this area. In our field cars we have literally ascended mountain slopes, struggled across the crests and slithered down the other side, somehow or other reaching the basin below without damage; we have hauled rock and built roads across marshes that would have been otherwise impassable; and we have driven miles and miles through floury sand dunes which other cars dared not traverse. As a "skipper" Mr. Campbell has become quite famous among brother scientists, and in addition he leads and equips all expeditions and supplies the mechanical skill to mend anything about our cars that may happen to break down when we are far from habitation. The work simply could not have been carried on in this district with a less able or skillful leader.

A word of praise is certainly due Mr. Charles Amsden, who took us in charge when our archaeological studies were in their infancy, and has accompanied us into the field on nearly all of our major expeditions. His was originally the clear and far-seeing mind that visioned very old cultures in the southern California deserts, and had it not been for his guidance, this line of archaeology might have been long suggesting itself to us.

After all our work is done, trained geologists must accompany us to the field and interpret the geological story for us. The California Institute of Technology has been very graciously aiding us with both paleontologic and geologic problems, and giving us of their time and experience towards a solution of the story. With such competent aid as we are receiving from the Southwest Museum and the staff of the California Institute of Technology, we should not go very far astray from the truth in our ultimate conclusions.

SUMMARY

While we are conscious of the need of being extremely conservative in any arbitrary placing or segregating of definite cultures in the time scale until further evidence is in hand, nevertheless it becomes apparent that already certain objects fall more or less into a chronologic sequence. That most of the late camps in the district are arrow point-potsherd sites (Plate 26, b) is certainly indisputable; that the arrow point-non-potsherd (Plate 26, a) camps precede them is indicated not only by the lack of sherds but by the fact that most of these camps thus far have been discovered at a considerable distance from any known water hole, and that the flint and polished-stone objects found thereon are generally more sandblasted and decomposed than those on the former sites.

That the Big Blade camps (Plate 25) might be younger than the Pinto and Silver Lake cultures, and other forms discovered which have not yet been definitely segregated (Plate 27), is suggested by the occurrence of these Big Blade camps near present-day water holes or on the shores of sinks where water still may be found for short periods of time. That the older cultures (Plate 20) appear either on high terraces far back from the shores of present sinks or along extinct rivers certainly suggests that these sites could have been habitable only had a moister climate produced water in places where none is found today. That the points found on these sites are too large and heavy for arrow points, and must fall into the dart-point group, seems established; that many of the flint artifacts more nearly resemble Old World types, not only in form but also in the lack of pressure retouch, than they resemble recent desert cultures, is suggested; that usually camps cover too large an area to be associated with a spring is implied; all these indications seem to point to a considerable antiquity. Then there is also that puzzling recurrence of fossil bones with these types.

As more evidence is garnered, and the exploration of the region progresses, no doubt at least some of the problems that confront us will be solved.

ARCHAEOLOGY AND RELIEF[124]

F. M. SETZLER[125] AND W. D. STRONG[126]

IN DECEMBER 1933, under the Civil Works Administration, a number of archaeological projects were organized with the primary purpose of reducing unemployment. The scientific direction of these particular emergency measures was given to the Smithsonian Institution which, since its founding in 1846, has carried on much important prehistoric research for the National Government. In the nature of the case it was the primary purpose of the C.W.A. to set a large number of unemployed persons to work with the least possible delay, while it was the duty and desire of the Smithsonian Institution to see that the scientific results attained might be as extensive and complete as the unusual opportunity warranted. The present article aims to sum up briefly the nature and results of these particular projects and their bearing on the wider problems of scientific archaeology as a channel for relief employment.

In this case the choice of archaeological sites was limited by climatic and economic factors. First, the work must be done in regions where winter conditions were mild, and second, it must be carried on at sites where unemployed labor was abundant and close at hand. In all, eleven C.W.A. archaeological projects, employing about 1,500 persons, were launched within a month. Seven of these were in Florida, and one each in Georgia, North Carolina, California, and Tennessee.

The seven sites excavated in Florida were selected with the above qualifications in view and also with a scientific aim: to secure a cross-section of the aboriginal cultures in the state. The northern half of the Florida peninsula was formerly occupied by tribes belonging to the Timucuan linguistic stock. In this region excavations were begun on the Canaveral peninsula, and a number of habitation and burial mounds that yielded many skeletons and a limited number of artifacts were opened. These structures apparently pertained to the Surruque Indians who occupied this part of Florida when it was discovered by the Span-

[124] Reprinted with permission from The American Scholar, Vol. 5, No. 1, pp. 109–117, 1936.

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iards. Hitherto Surruque history has consisted solely of a brief catalogue of repeated disasters ending with the extermination of this tribe slightly more than a century after its first contact with Europeans. At Ormond Beach, in what the Spanish called "the fresh-water provinces", another important excavation was made. A mound containing scattered burials was opened and below this were found two concentric circles of extended burials apparently contemporaneous with the village-site materials which also underlay the mound. Pottery vessels, pipes, and carved shell and stone ornaments occurred in these levels, their specific styles throwing considerable light on the civilization and antecedents of the Mayaca Indians, also of Timucuan stock, who occupied the area at the time of discovery.

South of Lake Okeechobee in the central portion of Florida is a rather different archaeological area, once occupied by the Calusa Indians. Excavations in this region were made at Belle Glade, at sites on the Little Manatee River and near Englewood. The Belle Glade site was exceptionally significant since it consisted of a true refuse heap or midden, not a shell heap, above muck deposits. There was also a burial mound in association with it. Particularly striking were a number of elaborately carved wooden specimens that had been preserved in the muck. Many years ago Cushing found almost identical specimens at Key Marco on the west coast, but so rarely are perishable materials preserved in this general area and so unique were the finds that many questioned the authenticity of the first discovery. The Belle Glade specimens prove their authenticity and prehistoric age beyond any doubt. In addition the Belle Glade excavations yielded numerous skeletons, broken pottery, and bone, stone and shell artifacts, all of which throw much light on the nature and extent of the Calusa culture. Several mounds on the Little Manatee River, quite similar in external appearance, proved to contain quite different burial and ceramic types. In one all burials were cremated, in another all were flexed, and in still another all were secondary—that is merely bundles of previously exposed bones. The mound containing the cremations also revealed the complete floor plan of a mortuary temple, the first yet reported from this area. Certain of these sites dated from early post-Spanish times whereas others were prehistoric, indicating a complex history which is being worked out as the data are studied. Near Englewood, under two superimposed mounds, was found a large pit containing more than 100 burials. These were covered by a sterile sand mound which in turn was covered by a layer of white sand on top of which was another mound containing

numerous secondary burials. The pottery from this complex site is of the finest quality yet known in the Southeast and represents a southern thrust of a more northern ceramic type.

In Georgia a large group of mounds near Macon yielded especially valuable and picturesque results. One large mound in the Lamar Group was found to have a spiral causeway rising from base to summit. Another, on the Macon plateau, showed at least five successive levels of construction. The top of each level had been sealed with gray or else with vivid red clay, and the vertical profiles showing these successive colored layers are extremely striking. Beneath the base of this mound was a human skeleton covered with thousands of bone and shell beads. The manner in which these were placed indicated that they had formed necklaces, arm bands, and probably decorations on a woven mantle. Careful technique in opening this tomb revealed details of the timbered walls and log mould uprights, with crosspieces clearly indicated on the floor of the grave beneath the bundled bones. Under a small mound nearby was uncovered the entire floor of a still earlier ceremonial house or temple. The floor of this structure was of hard clay, polished by thousands of moccasined feet, and around the circular wall ran a bench on which fifty individual seats had been modelled from clay. Before each seat was a rectangular hollow where the occupant probably placed his smoking and ceremonial apparatus. Opposite the entrance, which faced the southeast, was the modelled head and body of a great bird, probably an eagle, which was raised above the encircling seats. This was apparently the great altar. Details of construction, such as the conventionalized, decorative design around the eagle's eye suggest similar devices carved on pottery and shell from the great aboriginal mound site near Moundville, Alabama. The fact that the subterranean passageway of this structure is so placed that the rays of the early morning sun enter the building and fall directly upon the central fireplace and altar is further evidence of the complex ceremonialism once carried on in this early American temple. The Macon site has proved to be so important scientifically and so intrinsically interesting that the earlier work begun under the C.W.A., the Smithsonian Institution, and the Society for Georgia Archaeology was continued under the Georgia F.E.R.A., and then by the W.P.A. for twenty-eight months of continuous excavations. Plans to have this area constituted a National Monument have now been completed.

His chroniclers say that when, in 1540, Hernando De Soto passed through the western portion of what is now known as North Carolina

he found an Indian town, called Guasili, of some 600 wooden houses. Although its size may have been exaggerated it was undoubtedly an important native metropolis. Garcilaso de la Vega records that "the lord who bore the name of the province left the capital half a league to meet the Spaniards, accompanied by 500 of the principal persons of the country, very gaily dressed after their fashion. His lodge was upon a mound with a terrace round it, where six men could promenade abreast". Here the hungry explorers were given a hearty welcome after their tedious journey through the Blue Ridge Mountains. To the amazement of the natives the Spaniards caught and cooked some of the Indian dogs, whereupon their hosts immediately rounded up some 300 of the creatures and presented them. Since the geographic location of this native capital seems to have been at the junction of Peachtree Creek and the Hiwassee River, near Murphy, North Carolina, a large mound located at this place was chosen for excavation. As the work progressed three cultural levels were determined: the surface of the mound which yielded intrusive burials (possibly of Cherokee origin) with associated European objects; the mound horizon itself; and the village-site deposit beneath the mound. Burials in stone-lined cists occurred in the mound horizon. Study of the distribution of the stamped and incised pottery and the red and black painted ware from the different structures may indicate occupation by different ethnic groups at different times. Here, as at other sites chosen for such work, the occurrence of an historic dated period of occupation permits the archaeologist to proceed logically from the known to the unknown in reading the record.

The area now included in the Shiloh National Park, located on the Tennessee River near Pittsburg Landing, is famous as a major battlefield of the Civil War, but comparatively few people are aware that this action took place over and among the mounds of an important aboriginal site. Since no complete scientific excavations had ever been made at this place it was selected for the C.W.A.-Smithsonian project in Tennessee. Mapping and excavation, amidst the dense deciduous forest that covers the site, revealed seven large earth mounds, six of which had been used for dwellings and one for burial, as well as numerous low elevations marking the places where prehistoric Indian houses once stood. The natives recognized the strategic nature of the site as well as did the Union and Confederate generals for, flanked by two steep ravines, the bluff village was also protected by an embankment which formed the foundation for a stockade. Abundant broken pottery vessels,

artifacts, and burials occurred in the village site. The excavations here yielded much evidence on the varied aspects of native life during the later prehistoric period. Since the general region is still very little known from the archaeological standpoint, the present work serves as a promising beginning toward a more complete understanding of an important culture area.

In California work was prosecuted in the southern tip of the great San Joaquin Valley, at present an important center for oil production. Two large refuse and shell heaps and several burial sites on Buena Vista Lake were excavated. The most recent of these larger middens was the early historic village of Tulamniu where Father Zalvidea visited the Yokut Indians in 1772. Scientific investigation indicated that behind this early historic date stretched an occupation period of perhaps two millenia at this one site. By detailed stratigraphic work, house plans and burial methods during the different periods of occupation were revealed, and a considerable section of early California history reconstructed. On a hilltop behind the mor recent of the two village sites 600 massed burials were uncovered. Near some of these were juniper posts, still preserved below the ground. It is hoped that when the study of annual tree-ring changes has been extended farther, these can be read to give the exact dates at which different burials occurred. California shell-heaps are noted for being very poor in artifacts but, thanks to the large-scale operations permitted by the abundant labor, as well as to the careful screening techniques employed, sufficient specimens were secured to permit full comparison with neighboring regions. These studies indicate that the ancient inhabitants of the Buena Vista middens were closely related to the occupants of the early shell mounds around San Francisco Bay, and that the remote ancestors of the modern Yokuts probably moved up the valley from that direction.

In passing, an important F.E.R.A. project near Marksville, Louisiana, directed by the Smithsonian Institution in 1933, should also be mentioned. A large archaeological site marked by mounds and earthworks was acquired by the city as a park, and the local officials invited the Smithsonian Institution to direct excavations there prior to reconstruction. These revealed a native civilization in the Southeast closely related to the most impressive mound-building culture of the Ohio region. The latter horizon, designated Hopewell after the site where it was first found, is entirely prehistoric yet advanced far beyond the status of the historic Indians of Ohio. At Marksville many of the distinctive northern objects, such as mica, obsidian, pearls, utensils and

ornaments of copper, as well as modelled pipes and figurines are lacking, but the advanced pottery from the two regions is practically identical. Other features such as mounds, platform pipes, and surrounding earthworks are likewise very similar. Since the Marksville variant of the Hopewell culture appears to be very early in the South and lacks many of the fully developed traits of the northern Hopewell, it may prove to be the hitherto unknown basic complex from which the exotic northern civilization arose.

From the scientific standpoint these various projects have thrown much new light on the status and nature of the native civilizations which preceded that of the white man in the regions investigated. In Florida the excavations on the Canaveral Peninsula tended to disprove the theory that the mainland had been strongly influenced by the aboriginal cultures of the Greater Antilles. Practically nothing was found to strengthen this widely held belief, whereas the evidence was strong that the higher cultures of native Florida had been derived from centers farther west, toward the Mississippi River. In so far as the artifacts themselves were concerned the discoveries at Belle Glade verified the earlier work of Cushing but indicated, contrary to Cushing's belief, that they pertained to the Calusa Indians and not to any exotic culture. In Georgia the Macon site yielded a stratigraphic series of ceramic types which will go far toward elucidating the sequence of prehistoric cultures over a considerable part of the Southeast. The same is true of the discoveries at Marksville, Louisiana, where the important connections established extend still farther afield. In North Carolina and Tennessee new archaeological areas were opened, and in California more light was thrown on the long and amazingly conservative development of native culture which characterized that region from early prehistoric to historic times. Since laboratory study of the specimens and data secured is still in progress, further consideration of the scientific results would be premature. The above merely indicates their probable importance from the standpoint of New World prehistory.

Considering the speed with which they were put in motion, the above-mentioned archaeological projects under the C.W.A. were surprisingly successful. From the standpoint of relief they provided immediate work for numerous people. Over 90 per cent of the funds expended went for labor, since the tools for manual work, both skilled and unskilled, as well as the materials for the preservation of the archaeological remains, cost very little; and because the values produced were entirely scientific and educational, there was no resultant over-produc-

tion. The main difficulties encountered were due to the failure of the original plans to provide for the supervision of the various aspects of each project by staffs adequately manned by technically-trained archaeological assistants, and to the fact that the exact amount of time and expenditure allotted to each project was constantly uncertain. This last factor prevented the accurate planning essential for the completion of a thoroughly productive piece of scientific excavation. So much for the immediate lessons acquired.

The actual application of large bodies of relief labor to scientific archaeological excavation must, however, be carefully considered in the light of broader scientific and educational principles. First, it must be remembered that the number of archaeological sites in the United States is strictly limited and that once a site has been carelessly excavated its value is totally destroyed. Such ancient ruins are really material documents that comprise the very stuff of American history. They are all that remain to enable future generations to trace out the story of the original settlement of the New World and the manner in which its strongly individualized and remarkable native civilizations came into being. No national monuments are more truly American than the great temple mounds of the Mississippi Valley, the cliff-dwellings and pueblos of the Southwest, and the great fortified villages of the Upper Missouri. These and all lesser sites contain valuable records which can only be read by those trained for such scientific work.

Recent years have opened new vistas in American prehistory and the work is still in its infancy. In New Mexico, Nevada, Colorado, Nebraska, and elsewhere, human artifacts have been found in association with fossil bison, the giant ground sloth, and the mammoth. Such finds indicate that the ancestors of the American Indian pushed into the North American continent at a very early period while the great Pleistocene ice sheet was still retreating to the north. Some competent students favor the theory that man arrived here even earlier, during certain inter-glacial periods. Certain stratified camp levels found in the Great Plains show the slow development of these early hunting cultures in their various stages. In the same area it has recently been demonstrated that the earliest hunting life was superseded by the advent of native farmers who grew corn and lived in permanent villages. These in turn were routed when the first white man brought in the horse, which was rapidly taken over by the Indians. Mounted, the hunting tribes swept over the Great Plains, setting up the nomadic, militaristic mode of life encountered by our first pioneers and later by our

army. In the Southwest the long complex story of the rise of the Pueblo peoples is now well known. Originally basket-making, seed-gathering, cave-dwelling, these people later moved into the open and built small adobe villages which in the course of time developed into the great communal apartment houses of the modern pueblo. Thanks to the newly discovered method of dating by tree rings, most of these larger ruins can now be assigned an actual date. Space forbids further details regarding the rise of the unique mound-building cultures of the Mississippi and Ohio River regions. Some of these may have been forced to migrate to other regions by the incoming Algonkians and the Iroquois, the latter a powerful people who pushed from the Southeast into the New York region; others were encountered by the first Spanish explorers in the South.

This is a mere suggestion of the long and important history patiently being pieced together by American archaeologists; no local problem but a vital and integral part of the larger picture of world prehistory that transcends all state or national boundaries. The earliest stages found in the prehistoric United States already suggest certain Paleolithic horizons in Europe and, when more work has been done here and in northern Asia, the human connections between the continents will become known facts instead of pure hypotheses.

The present actual status of archaeological conservation in the United States, however, is deplorable. Whereas the Scandinavian countries, France, Italy, Mexico, and many other nations, have nationalized their prehistoric remains in the belief that the objects themselves and the history they represent belong to the people as a whole and not to acquisitive individuals and curio dealers, no effort of this kind has yet been made in the United States. From motives of mere curiosity or greed, dealers and relic hunters in practically every state are steadily destroying an irreplaceable heritage. The Antiquities Act of 1906 forbids unauthorized archaeological excavation on public lands, but the law is difficult to enforce and, so long as archaeological specimens can be sold on the open market, can have at best a very limited effect. This annihilation of our "readable past" which, due to the great popularity of "relic hunting", is steadily growing worse, indicates the need for a carefully planned archaeological program before it is too late. At present a race between the scientist and the curio seeker is on. Scientists are relatively few in number and must work slowly and carefully, whereas relic hunters are extremely numerous, and loot sites with great rapidity. The probable outcome, unless definite action is taken very soon, is only

too obvious. Consequently, in mapping out any archaeological program, whether for emergency relief or for purely scientific purposes, the basic need for national conservation should be primary. Not only should each site opened be excavated with the greatest care, the material completely studied, and the results fully published, but certain sites in every area should be carefully preserved for research in the future, when new techniques have been developed. It is a sad paradox that at this time, when trained men are becoming available and new techniques for determining archaeological history are reaching a high pitch of development, the materials themselves should be vanishing like snow before the sun. It is even more tragic since an enlightened national policy in this regard could save them for all time.

REPORT
SOCIETY FOR AMERICAN ARCHAEOLOGY

THE ANNUAL MEETING of the Society for American Archaeology was held in Andover, Massachusetts, in conjunction with the meetings of the American Anthropological Association and the American Folk-Lore Society. The meeting of the Council of the Society was held at noon on December 28, 1935. The President, Secretary-Treasurer, and Dr. Spier were present. The matters discussed at the meeting were an informal consideration of the reports of the officers, of the nominating committee, and of the list of nominees for Fellows. Certain general policies of the Society were discussed quite informally.

The annual meeting took place on Sunday morning, December 29, in Phillips Hall, with approximately seventy-five persons present. The President, Dr. A. C. Parker, presided. The business of the Society was transacted in the middle of the morning immediately following Mr. Satterthwaite's paper. The reports of the Editor and the Secretary-Treasurer were read. The report of the nominating committee for officers for the coming year was submitted to the Society and was accepted. There being no further nominations from the floor, a motion was made instructing the Secretary to cast a unanimous ballot for the Society electing the slate, as submitted, for the year 1936. The President then presented the nominations for Fellows. Again, upon motion from the floor, these nominees were elected as a group. Dr. Spier and Dr. Parker spoke of the need of securing additional Affiliates for the Society and emphasized the service which could be rendered by each individual in sending personal letters to friends endorsing the Society. The business meeting was then adjourned.

REPORT OF THE SECRETARY

The report of the organization meeting held in Pittsburgh on December 28, 1934, and the Constitution and By-Laws of the Society were published in "American Antiquity", Vol. I, No. 2, pages 141–151. The terms of office of the members of the first Council were determined by lot early in January as follows: for one year, Diamond Jenness and Leslie Spier; for two years, Frank H. H. Roberts, Jr. and George C. Vaillant; for three years, Emil W. Haury and Wm. S. Webb; and for four years, E. F. Greenman and W. D. Strong. Hereafter, newly elected members of the Council will serve for a term of four years.

Application blanks for Affiliate membership in the Society, after having been approved by President Parker and Editor McKern, were distributed to a selected list of ninety-three names late in February. In April, the first call for

supplementary lists was distributed. Since then three circular letters have been issued in the membership drive. Because of the need for endorsements of the application blanks by Affiliates, a satisfactory method has not yet been developed for handling the long list of names obtained by Dr. Cole at the Chicago Fair and transferred to the Society last year. Today the membership records stand: 4 Life Affiliates, 328 Affiliates, and 16 Institutional Members.

The President, in addition to acting as a member of the Council, approved in May the form of the membership card, and in September appointed a nominating committee as follows: W. D. Strong, chairman, N. C. Nelson, and Wm. S. Webb.

The actions of the Council during the past year are as follows. In March, it delegated the power to approve applications for Affiliate membership to the President and the Secretary-Treasurer. In April, it approved the Editor's statement of plans and policies for the new journal "American Antiquity". In May, it designated the George Banta Publishing Company as publishers of this magazine. In October, it recommended that the annual meeting of the Society be held, if possible, in conjunction with those of the American Anthropological Association and the American Folk-Lore Society at Andover, Massachusetts, during the last week of December. In October, it approved the form of the nomination blank for Fellows in the Society. And in December unanimous approval was given of the first list of nominations for Fellows.

Respectfully submitted,

CARL E. GUTHE, *Secretary*

REPORT OF THE TREASURER

The present bank balance of the Society stands as follows:

Regular Fund	$249.45
Permanent Life Membership Fund	200.00

The usable funds of $249.45 are not sufficient to carry the cost of the last two numbers of Volume I of "American Antiquity". Since the present Affiliates are entitled to receive all four numbers of Volume I, it is obvious that the membership drive must be actively prosecuted.

REGULAR FUND

Gross Receipts

Balance on hand, January 1, 1935		$ 0.00
Dues:		
328 Affiliates	$985.00	
16 Institutional Members	48.00	1033.00
Gift to cover cost of plates in Vol. I, No. 1 of "American Antiquity"		75.00
Sale of extra copies of "American Antiquity"		2.00
Reimbursements		32.38
		$1142.38

Gross Disbursements

AMERICAN ANTIQUITY:

George Banta Publishing Company

Printing	$532.84	
Illustrations	180.50	
Distribution	22.77	
Reprints	30.34	
	$766.45	
Printing of forms & stationery		$ 32.97
P.O. Second Class entry fee		25.00
Postage and telegrams		52.34
Bank Service charges		14.37
Discounts to subscription agency		1.80
		892.93
Cash on hand, December 21, 1935		249.45
		$1142.38

Resources

Cash on hand, December 21, 1935	249.45
Due from reimbursements	3.60

Liabilities

Dues for 1936 already paid	$ 1.00
American Antiquity, Vol. I, No. 3 (in press)	?

PERMANENT FUND

Receipts

Balance, January 1, 1935	$ 0.00
Dues of 4 Life Affiliates	200.00

Expenditures

None	0.00

Respectfully submitted,
CARL E. GUTHE, *Treasurer*

REPORT OF THE EDITOR

In this my first report, I should like to present to the officers and members of this Society a brief statement of my conception of the primary purposes of your journal, AMERICAN ANTIQUITY, of the editorial policy which has been

adopted in conformity with these purposes, and of problems and prospects relating to the journal's future. I am all too aware of certain faults readily apparent in our first issues. It is the purpose of the Editorial Board to progressively eliminate these faults, a task toward the accomplishment of which your critical assistance is solicited.

The journal of any scientific society should have as a basic purpose the bringing of the geographically scattered members into a close circle of common interests and aims through serving as a ready channel for the dissemination of information and the exchange of ideas. This purpose is of increased importance in a society having both specialist and amateur members (employing the word "amateur" to designate students of non-specialist standing), and which proposes to establish a sympathetic understanding and mutually helpful coöperation between these two groups. If the Society and its journal are to succeed, the policy of the editor must be that of serving the best interests of both the specialist and the amateur; which is but another way of saying the best interests of American archaeology. I have tried to be guided in editorial policy by this general purpose.

Editorial problems immediately confronting us at the outset of the publication project may be classified as twofold, relating to (1) form and (2) subject matter.

Specifications for the format and subject divisions for the new journal were submitted to and endorsed by the Council previous to the printing of the first issue. It was thought advisable to follow the format of the *American Anthropologist*. The subject divisions employed incorporate ideas from both the *American Anthropologist* and the British magazine *Antiquity*. Of these divisions, it is anticipated that the "Editorials" and "Correspondence" divisions will involve more specifically the interests of the amateur, and that the divisions for scientific articles and "Book Reviews" will be of particular interest to the specialist, while the "Notes and News" and "Some Recent Publications" divisions should prove equally interesting to specialist and amateur. However, it is not intended that a sharp class distinction between the various divisions should be for a moment considered; our purpose is to unify, not segregate the interests of archaeological students, and all divisions are devoted to the needs of all students.

The editor's ability to observe critical standards in selecting matter for publication is strictly limited by the quantity and quality of matter submitted to him. At the outset there was little to choose from. We had a contract with a printer, and the immediate best interests of the Society seemed to require an early issue of the Society organ. We made use of the best of available materials. With the increased number of contributions now coming in, an improvement in the general standard should result. May I urge those of you so situated as to exert influence in this matter to direct to the editor's desk contributions of the desired scientific quality.

The assistant editors on the Editorial Board are largely dependent for news

items and similar matter upon the coöperative spirit of workers in their prescribed areas or subjects. Affiliates are urged not only to respond promptly to the proper assistant editor's requests for such material, but to forward items to him independent of requests. The success of the "Notes and News" division depends very largely upon this disposition on the part of scientifically active members in each subject or geographical division to willingly serve. Naturally neither the editor nor the assistant editors can adequately cover the entire field of the Americas without general assistance.

It is a cherished purpose of the Editorial Board to make AMERICAN ANTIQUITY not only a review reflecting the best interests of a large group of American archaeological students, but a representative journal for the entire American field. Success in this program will require a wide-spread circularizing of the aims and activities of the Society and its journal, and can approach accomplishment only through the separate efforts of all the membership. The Editorial Board will exert itself to the utmost to shape contributed materials into an attractive, critical scientific journal; it then rests with the membership to enlarge the scope of the publication's influence, and thereby to increase its size and breadth of interests.

The first volume of AMERICAN ANTIQUITY promises to have from 300 to 350 pages. Numbers 1 and 2 have been released. Number 3 is in press, due to be released on January 20. Material is coming in exceptionally well, considering the newness of the journal. The immediate outlook is favorable from every standpoint other than, possibly, a financial one. In fact, a larger, more interesting issue is possible whenever funds to cover the involved increase in expense are available. The last two numbers of Volume I will of necessity be somewhat smaller than Number 2, in order to meet probable budget limitations. A majority of the illustrations for Volume I will have been produced at the expense of the authors, to whom we are materially indebted for this important service.

I believe that printing costs have been as reasonable as may be encountered in the printing field, considering the quality of materials and workmanship.

Although I realize that there can be no immediate prospects for such help, the occasional services of a stenographer would be greatly appreciated. For the present I am assuming personally small expenses involved in correspondence and the mailing of manuscript and proofs to printer and authors.

I cannot end this report without expressing my sincere gratitude for the fine assistance rendered the journal by the many who have contributed matter for publication and constructive criticism, or who have served in other capacities. I am particularly indebted to Dr. Carl E. Guthe and to the assistant editors for their prompt, cheerful response to my many calls for aid. Without their valuable services the journal could not have hoped to meet with any degree of success.

Respectfully submitted,
W. C. MCKERN, *Editor*,
AMERICAN ANTIQUITY

REPORT OF THE NOMINATING COMMITTEE

As chairman of the nominating committee, consisting of N. C. Nelson and Wm. S. Webb, I take pleasure in submitting the following slate to the annual meeting of the Society for American Archaeology: President, Diamond Jenness; Vice President, Harold S. Gladwin; members of the Council to replace D. Jenness and Leslie Spier, retiring—Arthur C. Parker and M. R. Harrington.

The committee wishes also to present the following nominations for Fellows in the Society:

S. A. Barrett
Katherine Bartlett
Earl H. Bell
Glenn A. Black
Henry B. Collins, Jr.
Harold S. Colton
Frederica de Laguna
Anna H. Gayton
Harold S. Gladwin
Emerson F. Greenman
Carl E. Guthe
M. R. Harrington
Emil W. Haury
Florence M. Hawley
F. W. Hodge
Edgar B. Howard
Diamond Jenness
A. V. Kidder
A. L. Kroeber
Ralph Linton
Samuel K. Lothrop
W. C. McKern
Paul S. Martin
J. Alden Mason
Warren King Moorehead
Earl H. Morris
N. C. Nelson
Arthur C. Parker
J. E. Pearce
Oliver G. Ricketson, Jr.
William A. Ritchie
Frank H. H. Roberts, Jr.
Linton Satterthwaite, Jr.
Frank M. Setzler
Leslie Spier
Julian Steward
William D. Strong
A. M. Tozzer
George C. Vaillant
William S. Webb
Waldo R. Wedel
William J. Wintemberg

Respectfully submitted,
WILLIAM DUNCAN STRONG, *Chairman*
Nominating Committee

PROGRAM

The papers given at the meeting were as follows:

DOUGLAS S. BYERS, Pottery Making at Las Guabas, Coclé Province, Panama (Motion Pictures)

H. J. Spinden, The Intermediate Period of Maya Archaeology (Lantern)

Linton Satterthwaite, Jr., Masonry Buildings at Piedras Negras which Lacked the "Maya Arch" (Lantern)

Carl C. Seltzer, The Racial Anthropometry of the Zuni Indians, with Special

Emphasis on the Relationship between Archaeological and Physical Data in the Southwest.

Dorothy L. Keur, A Prehistoric Example of Erosion Control (Lantern)

Arthur C. Parker, Iroquois Effigy Combs (Lantern)

William A. Ritchie, New Evidence Relating to the Archaic Occupation of New York (Lantern)

Allen H. Godbey, The Patina Factor in Archaeological Chronology.

CORRESPONDENCE

The Indian Spoon

In recent years I have again taken up the very interesting search for old Indian camp sites. While covering over seventy-five sites in Colorado, Nebraska and Wyoming, I have been impressed by the number of so-called end-scrapers encountered.

The only use assigned to this artifact by authorities is that of a scraper for hides. It seemed to me that these scrapers were entirely too numerous, in proportion to the other, associated implements, for the work ascribed to them; consequently, I very soon began to hunt for a more logical use. The size and shape also seemed to indicate that they were formed for some other principal purpose, since the Indian undoubtedly designed his tools quite skillfully for the purpose to which he put them, and the small size of the end-scraper, in addition to the working surface and very blunt working edges, seemed a very poor design for a hide tool. In camp sites where broken bone was in evidence, I found that end-scrapers outnumbered all other artifacts, even the arrow point.

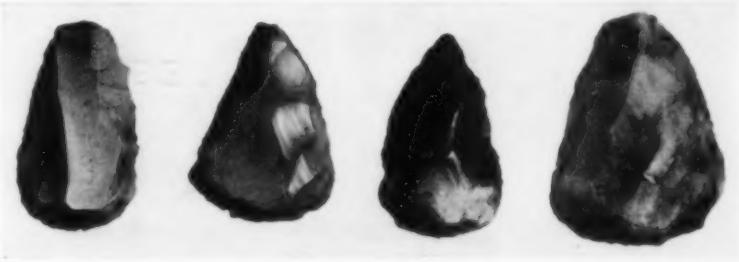

Fig. 9

Although nearly all students are familiar with the tool known as the end-scraper, some collectors may not be. Figure 9 illustrates typical end-scrapers, actual size, which, for reasons to follow, I am calling Indian spoons. These specimens are of jasper and came from a large, undisturbed, open camp in Wyoming which the recent winds uncovered. Such implements are characterized by the universally smooth and generally curved front or collecting face, the rounded working edge, the tapering sides and the thickness of the material.

In all investigated cases where sites that were buried or otherwise protected have been unearthed or exposed and worked by the same parties, so that the actual proportion of knives, scrapers, spoons, drills and arrow points could be determined, the spoon greatly predominates. In general, now speaking

of camp sites as a whole, the larger the amount of old, broken bone present, the greater the number of spoons found.

Many collectors have overlooked this most useful and, to the Indian, if my reasoning and logic are correct, necessary article. In examining these spoons in the collections of many hobbyists and students, I find a very consistent uniformity of sizes and shapes, and of wear from use.

In passing, it is interesting to note that the numerous spoons coming from the Folsom camp site, the Lindenmeier site discovered by Major Coffin, and now being excavated under the direction of Dr. Frank H. H. Roberts, Jr., of the Smithsonian Institution, are identical with the spoons of more recent origin. That is, although the arrow point of Folsom Man, thousands of years ago, was so peculiarly characteristic, there seems to have been no change in the tool used by the succeeding tribes, as we come down the thousands of years to our later Indians, for procuring the marrow from the bones for purposes of eating.

In numerous publications on Indian artifacts, we find this article spoken of as a tool for fleshing skins. However, I fail to find citations to back up this contention. Not that the spoon could not be used for this purpose, but rather that there are at least nine definite reasons for my believing that the scraping of skins was not the principal use, and probably not its use at all.

First: In the examination of hundreds of spoons, I find the smallest width to be about ⅜ inch, and the maximum size not over 1¾ inches. There are few of these extremes, most specimens running from ¾ inch to 1¼ inches. Even the largest of these is too small for economic handling of hides, and of course the small ones would be useless; a buffalo hide may run to 45 or more square feet. For hide work there would be no object in having the heavy blunt edge so carefully rounded and chipped, nor the front side smooth.

Second: The abrasions on the working edges, extending in the direction of the chipping (by some, it would seem, incorrectly called resharpening), are caused by a crushing pressure or impact and, with few exceptions, are found only on the Indian spoon. This could not be caused by working a green hide, or even a tanned one. In the working of stones the Indian made use of the principal of "sheer", as we use the term in the testing laboratory. This chipping or shaping of the stone may be produced by either impact—properly applied, or pressure—as with a bone. Sheering off the flakes of stone leaves a very smooth depression, the flake ending in a very thin, tapering edge. The abrasions on the edge of the spoon do not seem to be that produced by sheer, but by a crushing pressure which shatters, leaving a rough surface and with a shoulder at its completion. This shattering of the working edge is too slight to show well in a cut but is readily seen on the specimen.

On careful examination of spoons from all sources available, I find about 95% show the crushing on the edge. It is reasonable to presume that 5% were new and had been used little if at all.

Mr. Charles Simmons of Scottsbluff, Nebraska, who has made a study of the chipping methods of the Indian, has at my request made tests, and confirms

the statement that the abrasions on the edge of the spoons' working surfaces, do not seem to be due to a resharpening process but were caused by a crushing pressure.

Third: It would seem that the number of spoons are entirely out of proportion to other implements for hide work.

Fourth: There would be no object in making a hide scraper to always have a smooth curved face on one side. On the other hand, the very reasons that make the tool impractical as a hide scraper, make it practical as an implement for removing marrow from bones.

Fifth: In collecting the fragments of bone from the old camp sites, I find that the varying size of bones carrying marrow make it desirable to have varying sizes of spoons to scrape out this tasty fat. Again, in breaking the green bone to recover the marrow, sharp jagged edges are produced. The teeth of the Indian could not reach into these broken-bone recesses, and their sharp edges would cut the fingers.

Sixth: On experimenting with green bone, I find that the Indian spoon removes the rich, delicate food easily, quickly and safely.

Seventh: I also determined by test that by scraping the bone a little too hard, as a hungry man might do, the angle of application is such as to produce a crushing at the cutting edge and sides, identically like the crushed edges found on these spoons.

Eighth: Each person in the camp, men, women and children, would require his spoons, including different sizes for different curvations in the bone containing marrow. This easily accounts for the comparatively large number of spoons, and also for the varying sizes.

Ninth: The smoothly curved side extending back from the cutting edge or end gathers the marrow and also affords a smooth surface for the lip to rub on as the food is removed; again showing good design. No other artifact regularly carries this smooth surface.

No doubt the Indian needed tools to scrape and work the hides. These are found in the less numerous and less carefully worked oblong scrapers, spoken of as "blades" by Murdock.[127] These blades or scrapers afford a firm hand hold and cover a much larger surface, extending from two to several inches in length. This hide scraper, if such it is, and it is logically one, is thicker, less accurately made, and dull on the edge as compared with the Indian knife. In many instances it only has one working edge. As the wear on the hide scraper would be slight, one would last for long periods and duplicates would seldom need to be made.

I wish to herewith acknowledge and thank my friends and others who have given me access to their collections, and especially to thank Mr. J. D. Figgins

[127] Murdock, in his Ethnological Results of the Point Barrow Expedition, writes: "These people still retain the art of making flint arrows and spear heads and other implements such as the blades for the skin scrapers".

of the Colorado Museum of Natural History for his aid in guiding me in my field work and for his criticism of this paper.

IRWIN W. COX
Denver, Colorado

BE SURE THAT YOU ARE RIGHT

The writer endorses the Editor's statement to the general effect that when we criticise another's ideas we may find that "our own position is likewise subject to analysis and criticism".

Therefore he takes issue with the Editor on the scientific correctness of his method of quoting parts of definitions, on the fitness of those listed in dictionaries as archaic, and furthermore questions the natural inference involved that the definitions which the Editor appended to the writer's comments on *Accuracy in Terminology*, printed in the January issue, are those first listed in the dictionaries quoted, or are even the generally accepted definitions.

In large dictionaries the generally preferred or authoritative definition is usually listed as definition Number 1, and in their order of usage or importance others are numbered below. Many of the lower definitions include obscure, archaic, and obsolete meanings, and these are usually so marked.

Unfortunately most persons have ready access only to smaller dictionaries which usually list only definitions citing the generally accepted usage of words, or the Number 1 listing of unabridged dictionaries.

My letter was not written to stimulate a search for archaic or obscure meanings of these words, but instead it was intended as a plea for clarity, and the use of first definitions or the universal English usage to be found in all dictionaries.

The poet and the romancer may roam in dimly charted, or uncharted terminological seas without criticism, but we should expect scientists to seek clarity and exactitude of expression.

The writer has consulted *Webster's Unabridged New International Dictionary*, Second Edition, 1935, and has checked the Number 1 definitions listed in the Editor's note as derived from that dictionary, and in not one instance are these Webster quotations the first, commonly accepted, or authoritative Webster definitions, but are either archaic or obscure definitions listed below the commonly accepted definitions. A late copy of *Funk and Wagnalls' New Standard Dictionary* is not available, but the first or authoritative definitions in seven other available dictionaries, of various ages, conform rather closely to Webster. Copies of these definitions and comments on the Editor's versions follow:

Associate: The definition of this word used by the Editor is not the first accepted one listed in the dictionary as of best usage, but is the third definition from the top.

Webster's first definition for "associate" reads as follows: "(1) To join or

unite as a friend, companion, partner, or confederate; as to associate others with us in business."

Encounter: The definition used by the Editor is not the first and most authoritative one listed in the dictionary, but instead is only part of the second definition under noun, and the part quoted is greatly modified by that omitted by the Editor.

Webster's first definition for "encounter" reads as follows: "(1) To meet in opposition or with hostile intent; to engage in conflict with; as, to encounter enemies".

Characteristic: The definition used by the Editor is not the preferred first, but the second definition listed under noun.

Webster's preferred, or first definition for "characteristic", noun, reads as follows: "(1) A trait, quality, or property distinguishing an individual, group, or type; as, a characteristic of Lincoln, of Americans, of patriots; that which characterizes or is characteristic".

Recover: The definition used by the Editor for the word "recover" is not only the fifth numbered definition from the top, but its usage is definitely listed as archaic and as Shakespearean. While archeology treats of ancient things, we see no value in reverting to sixteenth century word usage in modern scientific journals. Most of us would not find Elizabethan spelling and usage conducive to clarity of expression.

Webster's first definition of "recover" is as follows: "(1) To get or obtain again; to get renewed possession of; to win back; to regain, as lost property, territory, appetite, health, courage".

CYRUS N. RAY
Abilene, Texas

A FLINT SPUD FROM CAHOKIA

Material characteristics of the so-called Cahokia or Monk's Mound "culture" include a number of interesting types of chipped-stone artifacts; such as the base-notched point, the large flint spade, the notched hoe, and the semi-polished "turtle-back" adze. However, there is a type of implement, apparently of select material and invariably exhibiting superior workmanship, which may belong to this complex although it has not been included with Monk's Mound traits.

The specimen illustrated in Figure 10 is from the Cahokia Mound site, Madison and St. Clair counties, Illinois, and was plowed up about one mile west of Monk's Mound on April 22, 1935. It is 8 5/16 inches long and 4 3/16 inches wide across the points; the material is a multi-colored opaque flint that has been ground and polished until nearly all of the depressions made by the flaking have been removed. The colors range from a bluish-gray to a purple and from a light yellowish-brown to a deep reddish-brown. On the reverse side at the top there is an area 2 inches by 1¼ inches where the outside weathered surface of the spall has not been worked off on account of the thinness of the

piece in this region. Also, on the reverse side, there is a long, irregular, steel-gray mark, beginning one inch back of the bit and extending for the full length of the piece, that was produced by the plow.

Village site materials are very profuse upon the slope where it was found. The heavy rains last spring removed about three inches of top soil from the slope, and, in course of the plowing of a corn field, the spud was brought to the surface. The finder's brother, who has picked up Cahokia materials for me during the past fifteen years, was in the field at the time and noticed a fresh break in the top of the piece, the missing portion being about one-half the size of a dime. After a diligent search, he was fortunate enough to find two small flakes that filled in this area completely.

FIG. 10

Pieces of this type are quite rare, but others from Cahokia are known. Moorehead pictures one in *The Cahokia Mounds*, University of Illinois Bulletin, Vol. 26, No. 4, and states that it is now in the Peabody Museum at Harvard, and was secured at Monk's Mound in 1873. It is made of a highly colored flint, dark brown and yellow with a suggestion of pink in the coloring, and is approximately 9½ inches long. From the sketch, the bit appears to be somewhat narrower and more rounded than the one illustrated.

Another specimen is in the collection of the Missouri Historical Society, Jefferson Memorial Building, St. Louis. It is 7⅞ inches long and white with a small amount of pink coloring, the material probably being a novaculite from Union County, Illinois. The bit of this specimen is about as wide but more rounded than that of the most recent find. It is reported as being one of a cache of twenty, and was found about sixty years ago. The story of its finding is that in 1876 the Chicago and Alton Railroad destroyed one of a small group of mounds at Mitchell, Illinois, about ten miles north of the large Cahokia group. As a result, quite a few artifacts were uncovered, some of which, including the cache of twenty spuds, were obtained by a storekeeper at Mitchell. The one now in the Jefferson Memorial Building was sent to St. Louis for identification and, while there, all the others were lost in a fire.

P. F. TITTERINGTON
St. Louis, Missouri

NOTES AND NEWS

Arctic Area

Archaeological investigations under the joint auspices of the Smithsonian Institution and the National Geographic Society are to be carried on this summer on the Alaskan side of Bering Strait. The work is to be under the direction of Henry B. Collins, Jr., assisted by James A. Ford. Previous work at Bering Strait, on St. Lawrence Island, and at Point Barrow has revealed the existence of ancient but already highly developed Eskimo culture—the Old Bering Sea culture, and of intermediate stages between it and the modern. It is hoped that the present expedition may be able to discover earlier stages of the Old Bering Sea culture than are now known. An intensive search will also be made for the still earlier, and presumably pre-Eskimo remains, which should be present around Bering Strait, if, as seems likely, this was the point at which man originally entered the American continent.

Southwestern Area

The Laboratory of Anthropology is completing plans for its eighth annual field training course during the coming summer, which will cover all expenses for a group of four graduate students in archaeology to be selected by the field training committee of the Laboratory. This is the final group to be provided for by a gradually diminishing grant made by the Rockefeller Foundation for this particular purpose.

With the completion of this program of field training and other projects which have required close coöperation with eastern universities and museums, Dr. A. V. Kidder, who for nine years has faithfully served the Laboratory as Chairman of the Executive Committee, now retires and leaves the more concentrated program in the capable hands of Vice Chairman Dr. Carl E. Guthe, Director of the Museum of Anthropology of the University of Michigan. The Southwestern interests of the Laboratory have been strengthened by new appointments to the executive committee, including Jesse L. Nusbaum, who recently resigned as director, and Daniel T. Kelly, whose appointment as treasurer was announced in December. In addition to several projects now in progress, Kenneth Chapman, as acting director, is coöperating with the staff, looking toward a further concentration upon features of particular interest and importance to the Southwest.

The Davison Fund, which for the past two years has administered grants formerly made under the personal supervision of Mr. John D. Rockefeller, Jr., has announced its annual grant in support of the regular maintenance of the Laboratory, substantially duplicating its appropriation of 1933. This includes an outright cash contribution of $10,000, with the further provision as hereto-

fore that the Fund will match, dollar for dollar, any funds secured by the Laboratory from other sources up to the amount of $10,000, thus making the maximum possible resources available under the grant $30,000 for the year.

Laboratory records show a remarkable increase in attendance, beginning with 3,500 in 1931 and mounting to well over 14,000 in 1935. Practically every visitor during the past year was given personal attention, and many were assisted by the staff in carrying on special studies. From present indications the Laboratory is entering upon its busiest year.

Northern Mississippi Area

Dr. J. Brewton Berry of the University of Missouri submits the following report on archaeological field work in Missouri during 1935.

The archaeological survey of the state, which was begun in 1934, has been continued through 1935. During the first two months of the year the survey was conducted under the FERA. In September Professors Wrench and Berry of the University of Missouri, with the help of four NYA students, began a thorough survey of Boone County, covering on foot the banks of all streams, calling at every house, photographing collections, and gathering surface specimens from all sites.

For the summer session the University added an archaeologist to its staff, the position being filled by Mr. J. C. Harrington of the University of Chicago. Mr. Harrington gave a course in archaeological methods, and directed an excavation in which the members of the class participated. They opened a small mound five miles from Columbia, which contained a stone vault similar to those described by Fowke in Bulletin 37 of the Bureau of American Ethnology, and found several burials, a number of chert artifacts, and a few small potsherds. The published report of the excavation will be sent to anyone who desires it.

In October Professors Wrench and Berry began excavating a village site north of Columbia. Only a part of the site has been investigated at this writing, but they are finding grooved axes, grit-tempered cord-marked potsherds, chert spades and projectile points, and similar materials.

The Missouri Archaeological Society, which was organized in December, 1934, has had a year of very encouraging growth. The Society has assumed responsibility for the completion of the archaeological survey, and has begun publishing a quarterly bulletin, three numbers of which have been issued.

Northeastern Area

Director Arthur C. Parker and William A. Ritchie, of the Rochester Museum of Arts and Sciences, expect to continue the Museum's investigations of the early cultures of the New York area during the coming summer. Attempts will be made to locate in the St. Lawrence valley, where most of the ground-

slate ulus and points found in the state occur, definite sites of the now little known Ground Slate phase, the distribution of which includes much of New England and the Maritime Provinces of Canada. It is hoped that good fortune will reveal a station where these types will be accompanied by other objects in such a way as to reveal a culture complex and its relative position in the sequence as now established.

Excavations will be conducted in other parts of the state as well, and on one site in particular which was partly explored last fall. This component pertains to what is apparently the earliest occupation of New York, the Lamoka focus of the Archaic pattern. Neither pottery nor agricultural products occur in this horizon, which Ritchie has described in a paper now being published by the Morgan Chapter of the New York State Archeological Association. There are some reasons to believe that other foci of the Archaic pattern will soon be differentiated in New England, through the efforts of Douglas S. Byers and Frederick Johnson of Phillips Academy, whose statements follow.

(Johnson) Douglas Byers and I have begun a study of a group of stone artifacts which were excavated from three sites in central and eastern New England. We have classified the material by modifying a system which was developed by Black and Weer of Indianapolis. In addition to introducing some order into the material, we have been interested in its distribution and cultural associations. To date, our very incomplete information indicates that we are dealing with a stone industry which, on complete analysis, may be distinguished by certain technical features. This technique was used on water-rolled quartz pebbles for the most part, but it was also applied occasionally to other crystalline rocks.

We can say definitely that there is no pottery associated with these implements as they are found on two sites, one in Rhode Island and one in Connecticut. On the site in Massachusetts three implements and several chips were found twenty to forty centimeters beneath the bottom of a shell-heap which may be dated between 1650 and 1700. The exact relationship between the quartz implements and the shell-heap is not clear. For example, it is possible that the implements were deposited with the other implements in the shell-heap and then worked their way to the location at which they were found. Another idea may be offered, however. There are several types of stone and several types of implements found in the shell-heap, but no quartz and none of the types of artifacts under discussion were found with the shells. Aside from the quartz, no stone artifact or any sign of disturbance was found in the homogeneous subsoil. Thus it would appear that, in all probability, the artifacts in question are not to be associated with the shell-heap. Definite proof or disproof of this possibility will come with further careful excavation.

Assuming this possibility, and keeping in mind the other two sites, it is tempting to think of this peculiar group of implements as being more or less representative of a culture unit not associated with pottery.

The segregation of this group has many and important implications. The

"culture" is practically absent in Maine (except for the southern part). It is found in southern New Hampshire and more generally in Vermont. It has a continuous distribution southward along the coast at least as far as Virginia. To the west it is found in the Archaic pattern in New York, as described by Ritchie, and it is found in Pennsylvania. Further ramifications will undoubtedly appear with more detailed study.

The question of the age of this "culture" is of considerable interest. As has been said, it is old in New York State. For the rest of the area roughly indicated, it has been reported only in surface finds. In our excavations we have found the material in extremely interesting geological situations; ones which indicate some antiquity. Before making any further statements concerning the chronological provenience of this "culture," however, we are awaiting a careful and detailed geological survey of the region. Fortunately, this survey has been under way for some time and will reach the location of the sites in a short while.

(Byers) The Department of Archaeology, Phillips Academy, Andover, has been carrying on a semi-active program in connection with several amateurs in New England. Fred Johnson has commented on the material that has come from some of these sites, particularly on the quartz points that have such interesting possibilities of a connection with the New York Archaic pattern as determined by Ritchie.

There remains one aspect not commented upon. In eastern Connecticut there is a site that was brought to our attention by amateurs. The surface deposit, loam and humus, contains quartz and slate points and some rather large and crude quartz "turtle-backs," at least one of which shows evidence of having been used as a chopper. This type of material is scanty, and is found only above the junction of the humus with the loam weathered from the yellow glacial drift. On the surface of the drift, and in its upper few inches, there is a totally different type of material: a very fine-grained quartzite of an extremely compact type that shows a high degree of metamorphism. All specimens of this material so far found have been in the yellow stratum; none have been in the humus at any point where there is not some sign of disturbance and, which is more important, none have been found in conjunction with the quartz artifacts, nor has any quartz been found in the yellow dirt. There are not sufficient artifacts to permit classification as yet, although they seem to be of a rather heavy industry based on the use of cores. The implications of age are most interesting. We hope to have an expert geologist with us when we resume work next season.

Our plans for the coming season call for a continuation of this work, and the excavation of one or two sites that have been thrust under our noses. The Department is also coöperating with the Metropolitan Park Commission of the State of Rhode Island in the erection of Narragansett Village in Goddard Park, not far from Providence.

It is our earnest hope that some sort of an archaeological survey of New England may be carried on during the next few years. We plan to list as many

sites as can be found, and to give a synoptic review of the material from each site on the card which will represent it in the file. With this in hand we hope shortly to be able to establish a rather more coherent picture of the prehistory of New England than now obtains. In our undertaking the Department is asking for the support of all interested amateurs.

Frederick Johnson has been appointed to our staff and will come to Andover on the first of July.

Southeastern Area

Messrs. Dunbar Rowland and Moreau B. Chambers, respectively Director and Curator and Field Archaeologist of the Mississippi Department of Archives and History, submit the following report on work in Mississippi.

For three months during the summer of 1935 the State Archaeological Survey of Mississippi, sponsored jointly by the Mississippi Department of Archives and History and by the Smithsonian Institution, was represented in the field by Moreau B. Chambers, assisted by Slater R. Gordon. At the outset several weeks were spent in the continuation of the excavation program begun last season at Lyon's Bluff, in Oktibbeha County, where six additional flexed burials were encountered in the six-foot layer of midden accumulation near the base of the principal mound. Here also were found walls and floors of houses beneath several feet of refuse, somewhat similar in the materials used to the wattle-and-daub house remains that are scattered over the surface of the site. A preliminary study of the excellent collections of potsherds, both from the recently plowed surface and from the excavations, seems to bear out the conclusions reached last year that this site had connections with the Moundville component, with the so-called Fort Ancient culture, and with certain sites in Arkansas. Of interest was the finding of an alligator skull ceremonially included with a fragmentary burial.

Relief labor was used for two weeks while trenching three mounds of the Shiloh Church Group in Chickasaw County, yielding little besides interesting data on the construction methods employed.

A number of village sites in the portions of Pontotoc and Lee counties known historically to have been the home of the Chickasaw tribe were visited, and collections made from each. Of particular importance is the mass of surface material accumulated on the site of the Chickasaw town of Ackia, where the French under Bienville were defeated by the British-inspired Chickasaws in 1736. When studied, this material should give the historic Chickasaw culture criteria so long needed in the Southeast.

During the last two weeks of the season a small burial mound in Rankin County was excavated, from which were removed burials and accompanying finds similar to those recovered from the Dupree Mound in Hinds County during the 1927–1928 seasons.

Mr. Joffre L. Coe reports that the Archaeological Society of North Caro-

lina is making preparations for a two to three weeks excavation of a village site in Randolph County, North Carolina, starting the first of June. This site is believed by some to be the location of the Indian village Keyauwee, visited in 1701 by John Lawson, then surveyor general of North Carolina. Soon after his visit the village was abandoned and its exact location remains much of a mystery today. It is hoped that this excavation will yield sufficient evidence to determine the culture of its inhabitants, if not definitely to prove it to be the Keyauwee village.

In the spring of 1935 several interested members of the Society visited this site and conducted some preliminary excavations. In one of the test pits a burial was uncovered. Lying with the skeleton were 1300 small Marginella shell beads, seven bivalve shell beads, and one wooden ear-spool covered with copper. The beads were lying in such a fashion as to indicate that they were sewn onto some garment, and there was also some evidence to indicate that the beads were painted with yellow ocher. The beads were formed by grinding a hole through one side of the shell. Several specimens were sent to Mr. Boekelman at Tulane University for identification. He reports as follows: ". . . I would classify the univalve shells as *Marginella apecina* Menke, whose habitat ranges from Cape Hatteras to West Indies. . . . the other specimens or halves of a bivalve I would classify as *Liocardium serratum* Linn. whose habitat ranges between Cape Hatteras southwards . . .".

The ear-spool was composed of two oval shaped pieces of wood that are semicircular in cross section and when placed together resemble a flattened oval. The two halves were probably fastened together by a small wooden(?) pin, and the hole in which it was placed can be seen on both pieces. The wood was examined by Dr. J. N. Couch, botanist of the University of North Carolina, and determined to be a coniferous wood, probably pine. The copper covering was examined by Dr. Carl Borgman, metallurgist of the University of North Carolina, and with the help of the paper on *A Brief Metallographic Study of Primitive Copper Work*, appearing in Vol. 1, No. 2 of this journal, he was able to determin that the copper was hot worked and annealed at about 600 degrees.

The persons in charge of this excavation are: Dr. James B. Bullitt, Director; Rev. Douglas L. Rights, Assistant; Mr. Joffre L. Coe, Assistant; and Mr. Harry Davis, Assistant for the State Museum.

Mr. T. M. N. Lewis of the Department of American Archaeology, University of Tennessee, recently made a surface examination of a village site on the Duck River, and reports the following interesting finds.

In spite of the fact that this site has been cultivated for more than a century, a great abundance of potsherds and artifacts are present on or near the surface. Nearly 100 broken projectile points were found, including the following types: 4 small isosceles triangular points; 11 triangular points with convex sides; 24 points with contracting stems; 38 points with parallel-sided stems; 4 points with expanding stems; 13 notched points; 2 points with diagonal notches; and 1 point with base of stem notched. In addition, a few short drills and a

great quantity of crudely formed chipped-stone implements, comprising chisels, adzes, scrapers and unspecialized forms, were found. Aside from a single fragment of a sandstone discoidal, no polished implements were encountered.

The potsherds were all grit-tempered and cord malleated. Only 9 out of 643 sherds gathered had a smooth surface. The paste was a bluish gray, in instances discolored with red ocher. Some sherds were coated with a white clay wash, and a few bore a red slip. All rims were of the straight Woodland type and the lips were for the most part horizontal and sharp-edged.

There are stone graves on the site, and no earthworks. If these materials represent a single culture complex, it is one previously unknown for the immediate district.

The Kentucky Archaeological Society has recently elected the following new officers: President, Dr. E. S. Maxwell of Lexington; Vice President, Mr. Clell Cockrell of Mt. Sterling; Secretary-Treasurer, John L. Buckner of North Middletown; Chairman of the Executive Committee, Dr. C. N. Kavanaugh of Lexington.

General

On December 6 to 8, 1935, a small group of archaeologists gathered at the Hotel Marott in Indianapolis to discuss technical problems of mutual interest. The conference was sponsored by the Committee on State Archaeological Surveys, assisted by a grant from the National Research Council. The group consisted of Thorne Deuel (University of Chicago), E. F. Greenman (University of Michigan), James B. Griffin (University of Michigan), E. Y. Guernsey, Bedford, Indiana, Carl E. Guthe (University of Michigan), Charles R. Keyes (Iowa State Historical Society), W. C. McKern (Milwaukee Public Museum), William A. Ritchie (Rochester Museum of Arts and Sciences), Frank H. H. Roberts, Jr. (Bureau of American Ethnology), Frank M. Setzler (U. S. National Museum), John R. Swanton (Bureau of American Ethnology), Erminie and Carl Voegelin (Yale University), Wm. S. Webb (University of Kentucky), and Lloyd A. Wilford (University of Minnesota). The following Indianapolis students acted as hosts: Glenn A. Black, Amos W. Butler, Eli Lilly, William R. Teel, and Paul Weer.

The progress made during the last two or three years in the study of the archaeological data found in the wooded portions of the northern Mississippi Valley, the Ohio Valley, and the Great Lakes region indicated that a meeting such as this was needed in order to take stock and, if possible, to reach some general conclusions with regard to knowledge and method of procedure. The most important problem confronting the group was the formulation of a scheme of culture classification based upon the method suggested by Mr. McKern. It was felt that the area to be discussed should be limited geographically in order to prevent possible confusion resulting from an attempt to discuss too great a variety of cultural manifestations.

The first day was devoted to a series of reports from each of the delegates outlining briefly the major problems confronting them in their research. The discussion dealt largely with the description and grouping of the several trait complexes found in the various states. At the end of the day each member of the group had a more complete knowledge of the problems and attitude of mind of all of those present.

The second day opened with comments by Frank Roberts upon the problems of the area in terms of his experience in studying the archaeological problems of the Southwest. Then Dr. Swanton presented his interpretation as an ethnologist. The rest of the day was occupied by a detailed and highly interesting discussion of the difficulties involved in reaching some satisfactory classification of the data. It became evident that the Woodland complex was not as clearly defined as the Mississippi one. The chief difficulty seemed to be the determination of the relations of the manifestations to which the term Hopewell has been rather loosely assigned. As a result of the day's efforts, the evening was given over to working out a classification which would meet with the approval of all those present.

In this revised classification, only one term for a culture class was changed. It was felt that "Basic Culture" was too broad a term, and "Pattern" was substituted for it. The tentative grouping suggested by the conference consists of three Patterns—the Mississippi, the Woodland, and an unnamed third one. Of these three, the Mississippi Pattern is most clearly defined, with four Aspects in the Upper Phase and four in the Middle Phase. The Lower Phase of this Pattern was not discussed. The Woodland Pattern was given four Aspects under the Lake Michigan Phase and two under the Northeastern Phase. It is probable that additional phases of the Woodland Pattern will be established as the material becomes better organized. The third unnamed Pattern contains two Phases, the first of which is the Hopewellian with three Aspects. The second Phase, which is still unnamed, contains at present a single Aspect called the Adena. There was no intention on the part of the group at Indianapolis to consider this classification in any sense final. It is simply a preliminary organization of data which it is believed will serve as a useful tool in furthering the solution of the archaeological problems of this region.

Mrs. Schulte, the secretary of the Committee on State Archaeological Surveys, took careful notes at the conference and is now preparing a detailed report which will be mimeographed and ready for distribution to interested individuals some time this spring.

BOOK REVIEWS

The Significance of the Dated Prehistory of Chetro Ketl. FLORENCE M. HAWLEY. (University of New Mexico Bulletin, Monograph Series, Vol. 1, No. 1, pp. 1–80, 18 plates, Santa Fe, 1934.)

This volume is a most welcome addition to the archaeological literature on the Southwest. The author has taken one pueblo of the Chaco group, in which extensive excavation has taken place, and has applied various techniques to the unraveling of its story. First she has used exact prehistoric chronology obtained through the Douglass system of tree ring analysis, and then has tested against this the relative dating apparent in superposition of masonry types, stratification of trash mounds and cross finds of pottery. Seldom has so complete and satisfactory a report resulted from an excavation.

Dr. Hawley gives us a general survey of the area in which Chetro Ketl is found, a region today desert but one which must have supported a population of about 10,000 individuals in the eleventh century. This raises problems of climatic changes, forest retreat, and lowered water levels which the author attempts to answer in the final chapter.

Masonry types are described and these are dated by *a*) superposition and *b*) by application of the Douglass method to timbers found in the walls. In this connection a clear, concise description of tree-ring dating is given.

Next the refuse mound was tackled to discover if it might yield pottery sequences, also to find the relation of the dump strata to periods of building at Chetro Ketl. Alternate sections, four feet square, were excavated to original valley floor. The pillars exposed and allowed for the plotting of any stratification, while from the pits materials were taken out in 8-inch levels. Later these were carefully studied, sherds were classified, percentages taken and results tabulated for each section.

Study of soil content indicated that parts of the deposit were made up of daily sweepings, while other strata were primarily composed of old sweepings hard packed. It appeared that the compact debris had been removed from some abandoned portion of the pueblo and added to this dump. This was further indicated by the fact that certain strata contained late material lying below older.

At this point appears what is perhaps the most significant part of the investigation. Throughout the dump charcoal specimens, mostly small pieces of piñon branches, appeared. Dr. Hawley worked out a chart for Chaco piñon and found it to correspond closely to that of yellow pine. She likewise demonstrated that the charcoal specimens could be accurately dated.

Only about 20% of the charcoal found in the dump was of sufficient size to be dated with confidence, but this corroborated the pottery sequences and established clearly that a part of the dump was made up of redeposited materials. "Briefly put, part of the dump was upside down."

The purpose of a review is to indicate something of the character of a book rather than to serve as a brief. This volume contains so much of interest and value that it should be read by every student of archaeology.

FAY-COOPER COLE

Archaeological Investigations in the Bay Islands, Spanish Honduras. W. D. STRONG. (Smithsonian Miscellaneous Collections, Vol. 92, No. 14, 176 pp., 33 plates, 38 text figures, Washington, 1935.)

Dr. Strong in his report demonstrates what fruitful results can be obtained by the intelligent handling of a rapid field survey. His Smithsonian Institution party spent a month on the islands, and in spite of the short time available and the unfavorable conditions of the terrain, carried out an exhaustive sampling of the archaeological sites in the region. Dr. Strong also incorporated in his report the results of the successful reconnaissance made for the American Museum of Natural History by Junius Bird, archaeologist of the Boekelman Shell Heap Expedition, which Mr. Bird generously put at the author's disposal. For comparative material Dr. Strong utilized the collections which Mr. Mitchell-Hedges acquired for the Museum of the American Indian. The main body of this report is devoted to a description and appraisal of sites and specimens, but there is also a full historical introduction and a stimulating comparative section which concludes the paper. Dr. Strong not only has worked the material at his disposal into a foundation for further archaeological study in the Islands and on the adjacent mainland, but also has pointed the way toward likely fields of research in other parts of Central America.

Dr. Strong's conclusions are tantalizing. He indicates the fundamental importance of research in northern South America, and in Central America proper, but neither his own collections nor the existing published material provide clues as to the outcome of such an investigation. The so-called High Civilizations: Maya, Zapotec, Mixtec, and the like, seem to burst full-equipped from the mists of the past but, once in flower, they do not seem to have radiated specific cultural influence on their neighbors. Such examples of isolated civilizations might lead one to believe either that the time centers of Central American culture have not yet been defined or that the period of exchange and development of traits in their basal and significant forms was anterior to the culture stages now uncovered. If so, either in this previous epoch or in later cultures representing persistences of the more fundamental complexes, one might strike the main problems of Central American archaeology, and perhaps their solutions.

Dr. Strong has made a model report on his survey. He has evaluated his Bay Island material independently, without trying to thrust it into the few known Central American culture complexes, but at the same time he has presented all the available comparative leads. He has presented his factual material fully, but he has given a full meed of hypothesis in his conclusions. *Archaeological Investigations in the Bay Islands* is a real landmark to guide one in the uncharted regions of Central American archaeology.

G. C. VAILLANT

Excavations at Tiahuanaco. W. C. BENNETT. (Anthropological Papers of the American Museum of Natural History, Vol. 34, Part 3: 359–494, 1934.)

During 1932 Dr. Bennett spent six months in reconnaissance work in the highlands of Bolivia and southern Peru. Intensive work was evidently limited to Tiahuanaco, the type site for the "Tiahuanaco" culture. The Bolivian Government restricted the excavations to "ten test pits of not more than ten square meters in surface area each". This regrettable limitation prevented anything like a definitive study of the site being made and Bennett wisely oriented his work toward a stratigraphic determination of ceramic sequences. The pits varied in depth from 1 meter to a little more than 4.5 meters. Only two yielded satisfactory data on culture sequences. But these enable the author to establish (somewhat tentatively, as he states) the sequence: Early Tiahuanaco; Classic Tiahuanaco; Decadent Tiahuanaco; Post Tiahuanaco; and Inca. The discovery of the first of these and the stratigraphic determination of the sequence for the series may be said to constitute the major results of the work. Nothing antecedent to Early, itself a highly developed culture, was encountered.

The most spectacular find was that of the largest monolithic statue (length 7.3 meters) yet found at the site. It was carved in the "classic" style, i.e., like the "Gateway of the Sun". Directly alongside was a smaller "bearded" statue rather crudely carved in an entirely different style, and other crudely carved stones. They are chronologically but not stylistically contemporaneous. The reviewer humbly suggests that the "circular grindstone (?)" described on p. 444 may possibly be a sacrificial stone.

The paper concludes with an admirably cautious discussion of the problem of the relation of Tiahuanaco to related cultures, such as Chavin, Epigonal, and so on, found in both Coast and Highland sites from Ecuador to the Argentine, and emphasizes the need for further work carried on with an eye to cultural affinities and temporal determinations instead of glorified pot-hunting.

R. L. OLSON

Bulletin of the Texas Archeological and Paleontological Society. (Vol. 7, September, 1935.)

Nine articles, contributions to the archaeology of Texas, comprise the contents of this volume and seem to indicate a prevailing archaeological penchant among the members of the Texas Archeological and Paleontological Society.

It is rather remarkable to the reviewer to note the considerable strides made toward the development of systematic archaeology in Texas during the last ten years. When he left Texas in 1925 there were hardly a handful of active field workers and these were not associated in any effective society. Now it appears that significant exploration is being undertaken in several sectors and that valuable contributions to the practically negligible knowledge of the archaeology of the state are being made by a number of investigators.

Space hardly permits of comment upon all of the articles in the September issue of the Bulletin.

J. Alden Mason contributes in *The Place of Texas in Pre-Columbian Relationships Between the United States and Mexico* a useful caution against the tendency of many students to overemphasize the influence of the higher culture centers of Middle America upon the mound cultures of North America. He finds that evidence of such influence is rare and attenuated even in Texas, where peninsular continuity with Mexico might lead the systematist to find evidence of whatever annectance exists. Two possible points of contact are indicated in the Huaxtecan influences on pottery found near Brownsville, and in the Caddoan horizon of east Texas, Arkansas, and Louisiana. The resemblances between Mayan and Caddoan, while generalized, are considered sufficient to imply a connection at an early remove in Mayan evolution. A peculiar hiatus is remarked between the Mayan and Caddoan terminii, the intervening geographic area producing very little data at present writing on the transfer. Huaxtecan, an aberrant form of the Mayan, has only a faintly perceptible influence on the Texas coast (probably introduced in comparatively recent times by Coahuiltecan tribes), which latter in turn has little in common with Caddoan pottery. Attention is called to the need of intensive research in the crucial areas of Texas and northern Mexico.

Texas is strategic territory in the matter of recent discoveries and discussions of early flint industries in North America. Two articles, *Archeology of a Section of Upper Red River Drainage*, by Adolph Henry Witte, and *The Pottery Complex Artifacts of the Abilene Region*, by Cyrus N. Ray, present interesting flint materials obtained from surface collections in distant parts of the state.

It has been recognized that there are wide-spread evidences of flint industries in Texas, many of which show the characteristics of an early or primitive flint industry. In some cases they exhibit striking resemblances both in form and in technique of flint working to Lower Paleolithic specimens from Europe. I still remember something of the excitement caused when I displayed typical central Texas hand-choppers, which were practically indistinguishable from the Chellean *coup de poing*, to a Harvard seminar in archaeology. To my mind this pseudo-paleolithic facies in Texas flints illustrates one of the most striking examples of convergence in evolution to be found in American anthropology. Finding of such specimens *in situ* in definite archaeological provenience, in middens, as well as in surface collections, suggests that some of the historic or proto-historic Indian tribes of Texas, i.e., Tonkawa and Karonkawa, lived very much in the manner and general cultural level of extinct Australians regarded by some European prehistorians as survivors of a palaeanthropic racial group.

In the present articles the Texas investigators have refrained with commendable restraint from making any premature claims of antiquity. The Folsomoid appearance of some of the specimens cannot be gainsaid, either when individual artifacts or assemblages are considered. Here possible affinity with the "Folsom

Complex" cannot so easily or quickly be ruled out on the assumption of convergence. It is certainly tantalizing to find sites in peripheral areas, in Texas and in the southeastern United States, which yield collections of flint artifacts with Folsomoid reminiscences; and Antev has stated that some of the Texas flints are covered with gravels which are either glacial or pluvial. The reviewer has collections made from an intensively explored archaeological site in central Georgia, consisting of keeled, snub-nosed end, and side scrapers, knives, projectiles with Folsomoid specializations, which might well be substituted for some of the flints exhibited by Messrs. Witte and Ray without the change becoming apparent. Admittedly there is great need of caution in appraising these far-flung typological resemblances. Typology alone is not enough. Commingling of flints dropped on the same or nearby sites by both pre-pottery and pottery groups is not only possible but probable. Patination may prove a useful chronometric guide in the future, but in the present stage of our knowledge is hardly reliable as an index. On this basis some doubt may be expressed as to the implied assumption present in the title of Dr. Ray's article, particularly as regards his collections made primarily from the surface without definite archaeological or stratigraphic proofs of association.

Three articles contain information of value to students of technology: *Ornaments of East Texas Indians*, A. T. Jackson; *The Split Stick Basket*, Victor J. Smith; *Report of Four Shumla Cave Packets*, George C. Martin. The remaining numbers comprise two reports on smaller survey explorations. *A Report on the Archaeology of Titus County*, by Walter R. Goldschmidt; *An Archeological Survey of the Nueces Canyon*, by Vane Huskey. James B. Griffin, writing from the Ceramic Repository at the University of Michigan, gives an analysis of sherds sent in from the region near Abilene, Texas.

A. R. KELLY

SOME RECENT PUBLICATIONS

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